

11/12/96

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Re: Hart Crowser Limited Subsurface Investigation Fox Avenue
 Property dated November 12, 1996

Dear Will and Jean:

Enclosed is your copy of the Limited Subsurface Investigation of the
 Fox Avenue (Bunge) Property prepared for the (b) (6) Trust by Hart
 Crowser and dated November 12, 1996.

Sincerely,



Camille Taylor Ralston

CTR:lr 0106-3
 Enclosure

USEPA SF



1289008

Phase II

**Limited Subsurface Investigation
Fox Avenue Property
6901 Fox Avenue
Seattle, Washington**

**Prepared for
(b) (6) Trust**

**November 12, 1996
J-4643**



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PROJECT SUMMARY

This summary presents an overview of project findings from our limited subsurface investigation at the Fox Avenue property in Seattle, Washington (Figure 1). The Fox Avenue property includes an approximately 123,000-square-foot concrete tilt-up warehouse covering over 50 percent of the property and asphalt covering the rest of the property (Figure 2).

Subsequent sections of this report should be consulted for expanded discussion and detail, including Table 1 at the end of the report text which summarizes the soil chemical analysis results.

In general, results of the limited subsurface investigation indicate the following:

- ▶ There does not appear to be a widespread of soil contamination issue in the areas sampled and analyzed at the subject property, primarily between the 7.5- to 14.0-foot zone. Only two samples were chemically analyzed in the upper 2.5- to 4.0-foot range. The rationale to concentrate on the 7.5- to 14.0-foot zone was because this is the likely area where groundwater fluctuates and where indications of significant impacts to groundwater from on-site sources would be detected.
- ▶ The field observations or screening results at the sample locations did not indicate obvious contamination, with the exception of HC-4. HC-4 appeared to contain a mysterious whitish material, metal debris, and petroleum-like odor at depth.
- ▶ The metal concentrations primarily were within background levels and TPH was only detected in the soil samples from HC-4 and HC-5.
- ▶ Volatile organic compounds were detected in several of the soil samples; however, not at significantly high concentrations. The sample results were not definitive in identifying whether these detectable concentrations were coming from an on-site or off-site source through vapors from the groundwater or in the soil itself from releases. However, based on our screening results and the knowledge from public records that the Great Western Chemical Company is actively working with Washington State Department of Ecology (Ecology) to cleanup up a chlorinated solvent contaminated groundwater plume that has been identified as crossing over the southeast edge of the subject property, the volatiles detected in the soil samples at HC-1 are likely from vapors from this groundwater plume.

RECOMMENDATIONS

The soils in the vicinity of HC-4 and HC-5 could be further assessed to determine the extent of the affected-material discovered in this area.

Additional soil sampling and analysis could be conducted in the upper soils above the water table to further assess the potential for on-site sources of contamination and impacts to groundwater.

If further assessment of on-site groundwater quality is desired, permanent groundwater monitoring wells could be installed and sampled to determine the potential impacts from on-site or off-site sources.

**LIMITED SUBSURFACE INVESTIGATION
FOX AVENUE PROPERTY
6901 FOX AVENUE SOUTH
SEATTLE, WASHINGTON**

INTRODUCTION

This report presents the results of our limited subsurface investigation for the Fox Avenue property located in Seattle, Washington (Figure 1). The work was completed in accordance with the work scope, as described in our contract (97-11-1003), dated August 29, 1996.

The purpose of the scope of work was to collect subsurface soil information to assist your assessment of the environmental status of the subject property. As discussed in our report, there is one current structure on the subject property. However, prior to the construction of the current structure, several historical structures occupied the subject property that conducted activities such as ship repair, metal fabrication, and electric thermostat manufacturing. In addition, surrounding properties include current and historical industrial businesses such as chemical manufacturing, boiler manufacturing, and transportation companies. These types of industrial uses may represent potential sources such as lead-based and copper-based paint, mercury, solvents, greases, and oils, which if released, could result in potential adverse environmental impacts to site soils and groundwater.

Our limited subsurface investigation focused on accessible areas (outside the current structure) that represented potential environmental concerns. The rationale for the location of each boring is as follows:

- ▶ **HC-1.** Closest to Fox Avenue South and the Great Western Chemical Company (Figure 2). No known on-site historical or current activities were identified in this area that had a high potential for adversely impacting the subsurface conditions.
- ▶ **HC-2.** Located in a position near a historical area of the subject property that may have been the sheet metal and assembling area and near a historical area of the adjacent property where a tar kettle building and boiler reaming area were located. There was also a suspect historical aluminum dipping area to the north of this sample location.

- ▶ **HC-3.** Located in a position downgradient from HC-2 and near a historical area of the subject property that may have had a paint spray booth.
- ▶ **HC-4 and HC-5.** These boring locations were selected because historical uses in this vicinity is believed to have been ship painting and repair. Based on historical maps and aerial photographs, the area of boring location HC-4 and HC-5, is where ships were likely brought up on the shore and painted and maintained. A 1949 Sanborn Fire Insurance map depicts a planed wharf on wood piling in the west end of the property (near HC-4 and HC-5). Ship building was known to occur in this area from 1917 to 1950. The current configuration of the property and location of buildings indicate that this area of historical ship repair and painting

Our work for the current project was completed to assess the chemical quality of subsurface soils near these sources of concern at the subject property.

Scope of Work

The limited Phase II soils assessment scope of work consisted of the following activities:

- ▶ Advancing five hollow-stem auger soil borings to an approximate depth of 14 feet;
- ▶ Collecting soil samples at 2½-foot-depth intervals in each of the hollow-stem auger borings. The soil samples were screened in the field for indications of chemicals of potential concern;
- ▶ Submitting two soil samples from each boring for chemical analysis;
- ▶ Evaluating and/or validating field and laboratory analytical data;
- ▶ Discussing soil results with (b) (6) Trust representatives, and preparing this report.

The remainder of this report is divided into five sections:

- ▶ **SITE DESCRIPTION** provides a summary overview of the physical setting and adjacent land use of the subject property;

- ▶ **PREVIOUS ENVIRONMENTAL REPORT** provides a summary discussion of a previous Phase I Environmental Site Assessment prepared by Hart Crowser in June 1995;
- ▶ **SITE GEOLOGY AND HYDROGEOLOGY** summarizes soil stratigraphy and possible groundwater conditions (groundwater flow direction) observed in soil boring explorations installed during the limited subsurface investigation; and
- ▶ **RESULTS AND CONCLUSIONS** describes our sampling and analysis rationale; the chemical analyses results for the selected soil samples; provides a general comparison of chemical concentrations to applicable regulatory cleanup levels; and presents our data interpretation and conclusions.

Table 1 summarizes our analytical methods and analytical results. A Vicinity Map is presented on Figure 1. Figure 2 presents a Site and Exploration Plan showing prominent site features and exploration locations. Figures are located after the tables at the end of the text.

Two appendices are also included at the end of this report. Field exploration and sampling methods are provided in Appendix A. Boring log for five borings are presented on Figures A-2 through A-6. A key to the soil boring logs is provided on Figure A-1. A data validation summary and laboratory analytical certificates from Analytical Resources Incorporated (ARI) and the Hart Crowser Chemistry Laboratory are provided in Appendix B.

SITE DESCRIPTION

The Fox Avenue property is located at 6901 Fox Avenue South in the Georgetown area of Seattle, Washington. The size of the property is approximately 5 acres with a majority of that area covered by a 123,500-square-foot concrete tilt-up warehouse (Figure 2).

The Bunge Corporation currently occupies the warehouse. They produce over 200 dry products such as cake and pancake mixes at the subject property. Bulk oils, such as canola oil, are received by rail, and dry bulk items, such as flour and sugar, are received by truck.

Seven silos are also located near the western end of the subject property and contain bulk ingredients used in their production of food products. A shipping office and freezer/refrigerator are located in the eastern portion of the building.

A large asphalt paved parking lot is located to the south of the warehouse. Numerous trucks move in and out of this area during the day and dock up against the south side of the warehouse. A rail spur is located along the north side of the warehouse and the northern property line. Raw materials are brought in that are used in producing various food products.

The subject property is bounded to the north by Northland Services, Inc./ Glacier Marine Transport, to the east by Great Western Chemical Company, to the south by the Seattle Boiler Works, and to the west by the Duwamish Waterway.

PREVIOUS ENVIRONMENTAL REPORT

A preliminary environmental assessment was prepared on the subject property in June 1996. The purpose of the assessment was to determine the likelihood of adverse environmental impacts to the subject property by potential on-site and off-sites sources.

The preliminary environmental assessment report indicated that there was a potential for on-site environmental concerns because of past historical industrial operations on the property and specifically near the southwest side of the property.

These concerns were associated with the possible releases of chemicals associated with ship repair, sheet metal fabrication, and electric thermostat manufacturing.

The other main potential for on-site contamination is from the off-site source of the Great Western Chemical Company, located directly east of the subject property and on the east side of Fox Avenue South. The Great Western Chemical Company is actively working with Ecology and is cleaning up the identified groundwater plume. The groundwater plume of chlorinated solvents originating from GWCC, crosses the southeast corner of the subject property onto the Seattle Boiler Works located directly south of the subject property.

In addition, there were 20 sites identified within 5/8-mile radius of the subject property that are on Ecology's Register and Toxic Sites and thirty-five sites within the same radius with confirmed releases from USTs.

Historical uses surrounding the subject property have also been generally industrial.

The preliminary environmental assessment recommends conducting a limited subsurface investigation in the southwestern area of the property.

GEOLOGY AND HYDROGEOLOGY

Regional Geology and Hydrogeology

Soils in the area are primarily alluvial sands and silts with discontinuous areas of recent fill. The fill soils generally appear to be of local origin, including some debris and dredge spoils from river channel improvements, but mainly local soils disturbed by construction.

Below the fill are alluvial soils comprised of sand and silty sand with occasional silt interbeds. Reports by others indicate that alluvial deposits extend to greater than 60 feet. Hart Crowser explorations in the vicinity of the subject property encountered considerable variation in apparent density or consistency of these soils.

Groundwater is typically encountered below about 10 feet below the surface. Regional groundwater flow direction generally appears to be in a southwestern direction and reflects the Duwamish Waterway drainage pattern. Tidal fluctuations appear to affect groundwater in the vicinity of the subject property. Fill in old meander channels also may affect the local groundwater flow patterns in this area.

RESULTS AND CONCLUSIONS

This section of the report presents our investigation rationale, results of our work, and our conclusions based on these results.

Investigation Rationale

Seven general areas were identified as potential areas of concern based on our existing knowledge of the site and the previous preliminary environmental assessment. These seven areas include:

- ▶ The former ship repair area;
- ▶ The former potential paint spraying area;
- ▶ The former potential sheet metal and manufacturing area;
- ▶ The former electric thermostat manufacturing area;

- ▶ The former off-site tar kettle area on the Seattle Boiler Works property;
- ▶ The former off-site boiler reaming area on the Seattle Boiler Works property; and
- ▶ The southeast corner of the subject property near the Great Western Chemical Company.

Our scope of work for a limited subsurface investigation was designed to obtain information on the subsurface conditions near or downgradient of these areas. These areas were identified from reviewing historical Sanborn Fire Insurance Maps and aerial photographs. Their exact locations or previous existences are not confirmed; however, the general areas have been identified as potential concerns.

Most of the subject property is currently occupied by a large concrete tilt-up warehouse which covers some of these identified potential historical areas of concern. Therefore, our boring locations were limited to the undeveloped asphalt-paved areas and locations based on proximity, general representation of an area, or presumably downgradient locations. The objective was to screen these potential areas as possible and to assess major widespread contamination issues.

Soil Sampling and Analysis Results

Five soil borings were advanced by McDonald Drilling Inc. using a hollow-stem auger drill rig. The locations of the soil borings are presented on Figure 2. The depth of the soil borings range from 9.0 feet (HC-5) to 14.0 feet (HC-1 through HC-4) below ground surface. Soil samples were collected by Hart Crowser personnel at 2½-foot-depth intervals.

Field screening using visual observations and a photoionization detector (PID) did not indicate the presence of volatile organic compounds in hollow-stem soil samples except those collected from HC-1 and HC-4. Thus, we collected soil samples around the apparent groundwater interface zone from each of the hollow-stem auger borings and submitted them to the laboratory for chemical analysis.

Chemical analysis of soil samples included:

- ▶ Total Metals (EPA Method 7000 Series);
- ▶ Polychlorinatedbiphenols (PCBs) (EPA Method 8081);
- ▶ Total petroleum hydrocarbons (State Method WTPH-HCID); and
- ▶ Volatile Organic Compounds (VOCs - EPA Method 8260).

Table 1 presents a summary of detected analytes in soil. Appendix B presents the Hart Crowser and ARI laboratory certificates for the soil samples analyzed.

Boring HC-1. Low concentrations of chlorinated solvents, and metals, were detected in the soil samples collected at 12.5 to 14.0 feet (S-3) in HC-1 (Figure 2). Volatile organic compounds or metals were not analyzed at the 7.5- to 9.0- or 2.5- to 4.0-foot-depth intervals. At 7.5 to 9.0 feet (S-2), and 12.5 to 14.0 (S-3), the test results indicated non-detectable concentrations of TPH. TPH was not analyzed at the 2.5- to 4.0-foot-depth interval.

Groundwater likely fluctuates 1 to 2 feet at the depth of the detectable concentrations (9.0 to 13.0 feet is possible) based on the sites location relative to the Duwamish River and seasonal influence. At the time of drilling, groundwater was noted at an approximate depth of 11.0 feet.

Based on the depth of groundwater, the known source of chlorinated solvents in the groundwater from the Great Western Chemical Company, the location of HC-1 near the identified contaminated groundwater plume in the southeast corner of the subject property, the Photoionization Detector (PID) readings for volatile organics in the upper fill material being low or zero, and that no known on-site potential historical sources were identified near HC-1 for the detected concentrations of chemicals, the detectable concentrations of VOCs and metals in the soil are likely from an off-site source being transported through the groundwater.

The Great Western Chemical Company is actively working with Ecology to cleanup the identified contaminated groundwater plume.

The PID readings of 1 and 5 detected in samples S-2 and S-3 respectively, although not very high, indicate volatile organic vapors in the soil, likely from the groundwater.

Concentrations of volatile organics in soil do not exceed conservative cleanup levels specified in the State Model Toxics Control Act (MTCA).

Boring HC-2. There were slight detections of chlorinated solvents and metals in the soil sample collected at 7.5 to 9.0 feet (S-2) in HC-2, which is downgradient from HC-1 and the known contaminated groundwater plume. Again, this depth likely represents the water table zone (groundwater was also noted at 11.0 feet during drilling).

Therefore, these low detectable concentrations of VOCs and metals in the soil are likely from an off-site source.

VOCs or metals were not analyzed for the upper soil sample (S-1), so we cannot rule out the possibility of these detectable concentrations of chemical constituents in the soils analyzed in HC-2 were from an on-site source. However, the PID readings for all of the soils sampled at this location were less than 1, indicating no or low concentrations of volatile organic compounds.

Boring HC-3. Very low level VOCs were detected in the soil sample analyzed (S-2 at 7.5 to 9.0 feet), no VOCs were indicated in the other soil samples screened with the PID (S-1 and S-3) from HC-3. Groundwater was noted at a depth of 10.5 feet at the time of drilling for HC-3. Metals were also analyzed for S-2 and only low concentrations near or below background levels were detected.

No concentrations of TPH were detected in S-1 or S-2 from HC-3.

Boring HC-4. Low concentrations of VOCs were detected in soil samples collected at 7.5 to 9.0 feet (S-3) and 12.5 to 14.0 feet (S-4) in HC-4. Total metals and TPH were also detected in the two samples analyzed. The soil samples collected in HC-4 had the higher PID readings indicating volatile organics. The highest PID reading was in the sample at 4.0 to 7.5 feet. However, the material was comprised of gravel/wood and occasional metal debris and soil recovery was poor; therefore, there was not enough sample recovered for chemical analysis. Groundwater was noted at a depth of approximately 10.5 feet at the time of drilling.

The soil sampled in HC-4 from 2.5 to 9.0 feet was noted to contain a variety of fill material such as concrete, metal, wood debris, and an unknown whitish color material. Also, a very loose, wet, dark gray, silty, and fine sand with a petroleum-like odor was noted on the soil sample collected at 12.5 to 14.0 feet (S-4).

Sample S-4 detected the highest concentration of TPH (800 mg/kg), above the conservative 200 mg/kg MTCA Method A cleanup level for TPH. A concentration of 170 mg/kg was detected in soil sample S-3.

Sample S-4 was analyzed for PCB content. No PCBs were detected in this sample.

The detectable concentrations of VOCs and metals were slightly higher in Sample S-4 than in Sample S-3 from HC-4.

Based on these sample locations and results, there appears to be an on-site source for the TPH at a minimum and a pocket of affected material at depth. Since the detectable concentrations of VOCs in S-3 and S-4 are at a depth in or near the water table, it is not clear whether these concentrations are a result of an on-site or off-site source.

The area around HC-4 is where historically ship painting and stripping likely occurred. It is believed that this area is where ships were brought up on the shore and painted and maintained. A 1949 Sanborn Fire Insurance map depicts a planed wharf on wood piling in the west end of the property (near HC-4 and HC-5). Ship building was known to occur in this area from 1917 to 1950. Based on the current configuration of the property and location of buildings, it appears that this area of historical ship repair and painting has been filled in. Therefore, this variety of fill material and affected material may be related to the past practices that occurred in this area prior to filling.

Boring HC-5. The material encountered in HC-5 was extremely gravelly and full of debris. Sample recovery was very difficult. No PID readings were detected on two samples collected at depths of 2.5 to 4.0 feet (S-1) and 7.5 to 9.0 feet (S-2). Groundwater was noted at a depth of approximately 7.5 feet during drilling.

TPH analysis was conducted on Sample S-1, and a total metal analysis was conducted on Sample S-2. Low concentrations of TPH were detected in S-1 (110 ppm) and low concentrations of total metals were detected in S-2.

Assuming HC-5 is downgradient of HC-4, this reinforces the assumption that the previously identified material in HC-4 is likely localized around HC-4.

LIMITATIONS

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of (b) (6) Trust for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

The MTCA cleanup levels are included in this report are used for screening and comparison purposes only and are based on our

understanding of cleanup levels required by Ecology for similar projects. This comparison does not represent an interpretation of final MTCA cleanup standards for the site, since such standards are established by Ecology through a negotiation and public approval process. It should be understood that the MTCA Method B screening numbers were calculated using, to the best of our knowledge, the most current toxicity criteria available from EPA and Ecology. These criteria are continually being updated by EPA; and, as a result, the MTCA Method B levels used for screening purposes in this report may not be applicable for future use.

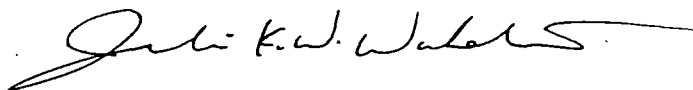
It should be noted that Hart Crowser relied on information provided by the reference sources indicated in the report text. Hart Crowser can only relay this information and cannot be responsible for its accuracy nor completeness.

Any questions regarding our work and this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to Julie Wukelic.

We trust that this report meets your needs.

Sincerely,

HART CROWSER, INC.



JULIE K. W. WUKELIC, Division Manager
Property Redevelopment Engineering

jkww:bjg
foxph3.fr

Table 1 - Chemical Results for Subsurface Soil Samples

Sample ID: Depth Interval in Feet	HC-1, S-2 7.5 to 9.0	HC-1, S-3 12.5 to 14.0	HC-2, S-1 2.5 to 4.0	HC-2, S-2 7.5 to 9.0	HC-3, S-1 2.5 to 4.0	HC-3, S-2 7.5 to 9.0	Method Detection Limit	MTCA Method A Soil Cleanup Level
PID-Reading	1	5	0	0	0	0		
TPH-HCID in mg/kg (ppm)								
Gasoline	nd	nd	nd	nd	nd	nd	10	100
Stoddard Solvent	nd	nd	nd	nd	nd	nd	10	100
Diesel	nd	nd	nd	nd	nd	nd	20	200
Oil	nd	nd	nd	nd	nd	nd	50	200
Volatiles in µg/kg (ppb)								
Acetone	na	13	na	nd	na	49	1.9	
Methylene Chloride	na	3.2 B	na	3.0 B	na	3.0 B	2.8	500
cis-1,2-Dichloroethene	na	3.7	na	nd	na	nd	1.4	
Trichloroethene	na	14	na	nd	na	nd	1.4	500
Tetrachloroethene	na	120	na	9.1	na	nd	1.4	500
Carbon Disulfide	na	nd	na	nd	na	nd	1.4	
trans-1,2-Dichloroethene	na	nd	na	nd	na	nd	1.4	
Isopropylbenzene	na	nd	na	nd	na	nd	1.4	
1,3,5-Trimethylbenzene	na	nd	na	nd	na	nd	1.4	
1,2,4-Trimethylbenzene	na	nd	na	nd	na	nd	1.4	20000
sec-Butylbenzene	na	nd	na	nd	na	nd	1.4	
4-Isopropyltoluene	na	nd	na	nd	na	nd	1.4	
n-Butylbenzene	na	nd	na	nd	na	nd	1.4	
Naphthalene	na	nd	na	nd	na	nd	6.9	
Metals in mg/kg (ppm)								
Aluminum	na	8180	na	12400	na	12000	3	
Arsenic	na	nd	na	nd	na	nd	7	20
Iron	na	3100	na	4400	na	4000	2.5	-
Cadmium	na	nd	na	nd	na	nd	0.5	2
Chromium	na	3.2	na	5.9	na	4.4	1.5	100
Lead	na	nd	na	nd	na	nd	5	250
Mercury	na	nd	na	nd	na	nd	0.05	1.0
Copper	na	7.1	na	8.5	na	8.8	1	-
Nickel	na	1.6 J	na	4.9	na	4.5	2	-
Zinc	na	9.4	na	9.6	na	11	0.25	-

nd Not detected

na Not analyzed

- No established MTCA limit

B Analyte detected in method blank

J Estimated value (concentration below detection limit)

Table 1 - Chemical Results for Subsurface Soil Samples (continued)

Sample ID: Depth Interval in Feet	HC-4, S-3 7.5 to 9.0	HC-4, S-4 12.5 to 14.0	HC-5, S-1 2.5 to 4.0	HC-5, S-2 7.5 to 9.0	Method Detection Limit	MTCA Method A Soil Cleanup Level
PID Reading	na	1.5	0	0		
TPH-HCID in mg/kg (ppm)						
Gasoline	nd	nd	nd	na	10	100
Stoddard Solvent	20	nd	nd	na	10	100
Diesel	nd	85	nd	na	20	200
Oil	170	800	110	na	50	200
Total PCBs in mg/kg (ppm)	na	nd	na	na	0.2	1.0
Volatiles in µg/kg (ppb)						
Acetone	38	46 B	na	na	1.9	
Methylene Chloride	3.8	3.1 B	na	na	2.8	500
cis-1,2-Dichloroethene	80	nd	na	na	1.4	
Trichloroethene	68	nd	na	na	1.4	500
Tetrachloroethene	330	nd	na	na	1.4	500
Carbon Disulfide	2.9	1.9	na	na	1.4	
trans-1,2-Dichloroethene	3.4	nd	na	na	1.4	
Isopropylbenzene	1.4	nd	na	na	1.4	
1,3,5-Trimethylbenzene	16	nd	na	na	1.4	
1,2,4-Trimethylbenzene	35	nd	na	na	1.4	
sec-Butylbenzene	5	nd	na	na	1.4	
4-Isopropyltoluene	6.2	nd	na	na	1.4	
n-Butylbenzene	2.8	nd	na	na	1.4	
Naphthalene	8.9	nd	na	na	6.9	
Metals in mg/kg (ppm)						
Aluminum	12300	9620	na	16000	3	
Arsenic	26	nd	na	nd	7	20
Iron	28000	8200	na	8200	2.5	-
Cadmium	1.8	nd	na	nd	0.5	2
Chromium	44	4.5	na	8.5	1.5	100
Lead	580	36	na	nd	5	250
Mercury	0.41	0.29	na	nd	0.05	1.0
Copper	360	47	na	24	1	-
Nickel	76	9.7	na	11	2	-
Zinc	6400	55	na	32	0.25	-

nd Not detected

na Not analyzed

- No established MTCA limit

B Analyte detected in method blank

J Estimated value (concentration below detection limit)

Vicinity Map



Note: Base map prepared from USGS 7.5 minute quadrangle map of Seattle South, Washington, dated 1973.

0 1/2 1
Scale in Miles



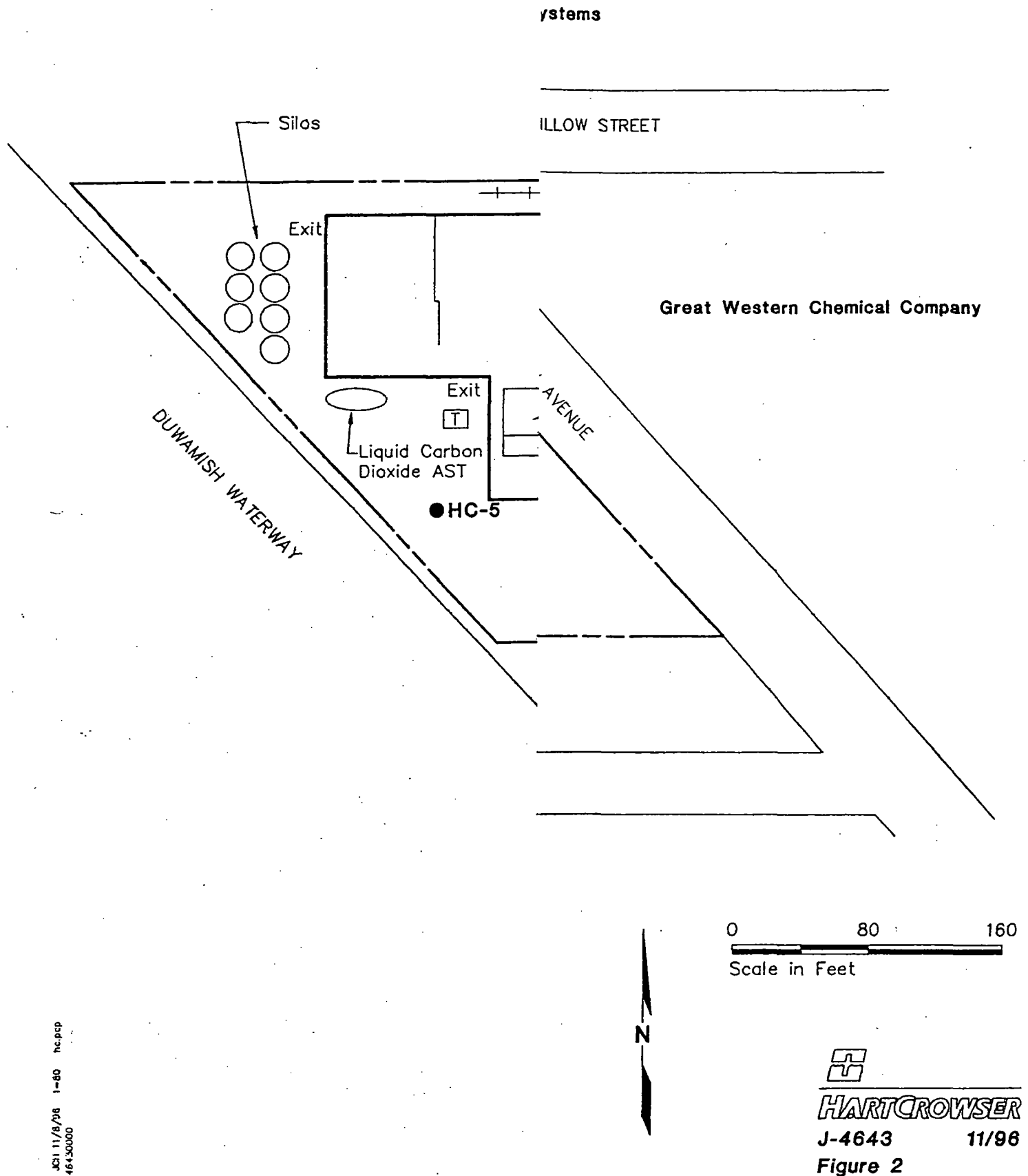
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Figure 1

Site and Exploration Plan



APPENDIX A
FIELD EXPLORATIONS AND SAMPLING METHODS

APPENDIX A FIELD EXPLORATIONS AND SAMPLING METHODS

Subsurface Explorations

Subsurface explorations for this project included advancing five hollow-stem auger soil borings on September 6, 1996 at the Fox Avenue property. Hollow-stem auger borings were completed using a hollow-stem auger advanced with a portable, wheel-mounted drill rig subcontracted by Hart Crowser.

Figure 2, Site and Exploration Plan, shows the locations of the borings. Exploration logs for the site explorations are presented on Figures A-2 through A-6 at the end of this appendix. The exploration logs show our interpretation of the drilling sampling data. They indicate the depth where the soils change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on Figure A-1, Key to Exploration Logs. Figure A-1 also provides a legend explaining the symbols and abbreviations used on the logs.

Soil Sample Collection

Soil samples from the site explorations were obtained at 2½-foot-depth intervals using a modified version of the Standard Penetration Test (SPT). Samples were collected by manually driving a 3-inch inside diameter split-spoon sampler with 140-pound hammer. The modified SPTs are an approximate measure of soil density and consistency. To be useful, the results must be used with engineering judgment in conjunction with other tests.

Organic Vapor Detection

Organic vapors were measured in soil sample jar headspaces during the field investigation using an HNU portable photoionization detector (PID). PID measurements were made by piercing the foil-covered headspace jar with the PID probe. These sample jar organic vapor readings are presented on the exploration logs on Figures A-2 through A-6.

The PID has sealed ultraviolet light sources which emit photons which ionize trace organics but does not ionize the major components of air. Which organic vapors are detected depends on the photoionization potential of the particular compounds, and the calibration and lamp voltage of the instrument. For instance, some organic vapors, such as methane, cannot be detected by the PID.

For the field observation, the PID was equipped with a 10.2 eV lamp. The instrument was calibrated to a benzene equivalent which has a relatively low human exposure threshold in air. The organic vapor concentrations measured by the PID can be correlated to the total volatile compounds in a given sample and are, therefore, a useful screening test. The PID values are also used for environmental monitoring as a health and safety measure.

Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.

Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Density		Consistency		
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

Estimated Percentage

Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Legends

Sampling Test Symbols

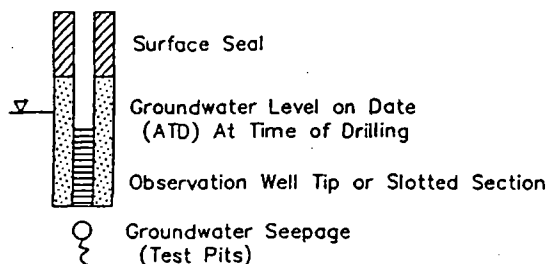
BORING SAMPLES

- ☒ Split Spoon
- ☐ Shelby Tube
- ☐ Cuttings
- ☐ Core Run
- * No Sample Recovery
- P Tube Pushed, Not Driven

TEST PIT SAMPLES

- ☒ Grab (Jar)
- ☐ Bag
- ☐ Shelby Tube

Groundwater Observations



Test Symbols

- GS Grain Size Classification
 - CN Consolidation
 - TUU Triaxial Unconsolidated Undrained
 - TCU Triaxial Consolidated Undrained
 - TCD Triaxial Consolidated Drained
 - QU Unconfined Compression
 - DS Direct Shear
 - K Permeability
 - PP Pocket Penetrometer
Approximate Compressive Strength in TSF
 - TV Torvane
Approximate Shear Strength in TSF
 - CBR California Bearing Ratio
 - MD Moisture Density Relationship
 - AL Atterberg Limits
- Water Content in Percent
- Liquid Limit
Natural
Plastic Limit
- PID Photoionization Reading
- CA Chemical Analysis



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Figure A-1

Boring Log HC-1

Soil Descriptions

Ground Surface Elevation in ????

6 inches of ASPHALT over medium dense, moist, brown, fine SAND with occasional silty zones.

Loose to medium dense, dark gray, fine SAND and slightly silty, fine SAND.

Bottom of Boring at 14.0 Feet.
Completed 9/6/96.

Depth
in Feet

0

5

10

∇
ATO

15

Sample

S-1

S-2

S-3

STANDARD PENETRATION RESISTANCE

▲ Blows per Foot

1 2 5 10 20 50 100

LAB TESTS & (PID)

(<1)

(1.0)

(5.0)

• Water Content in Percent



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Figure A-2

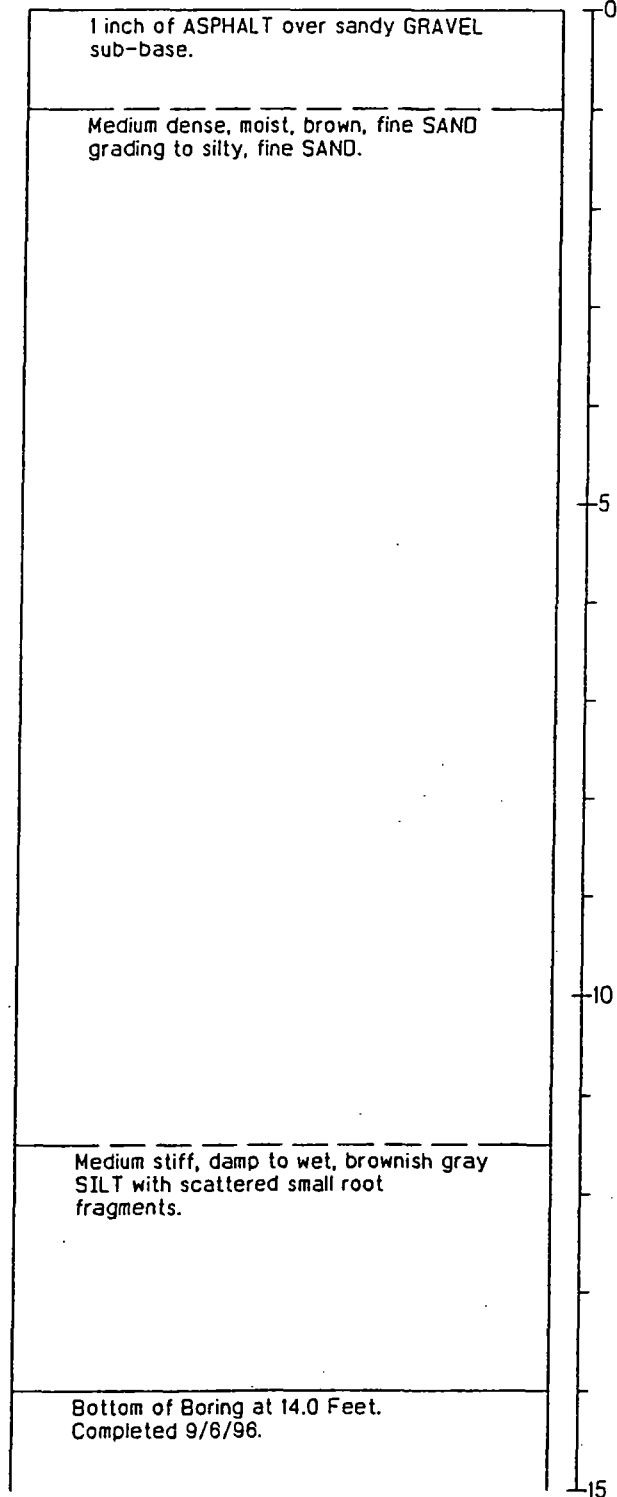
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATO) or for date specified. Level may vary with time.

Boring Log HC-2

Soil Descriptions

Ground Surface Elevation in ????

Depth
in Feet

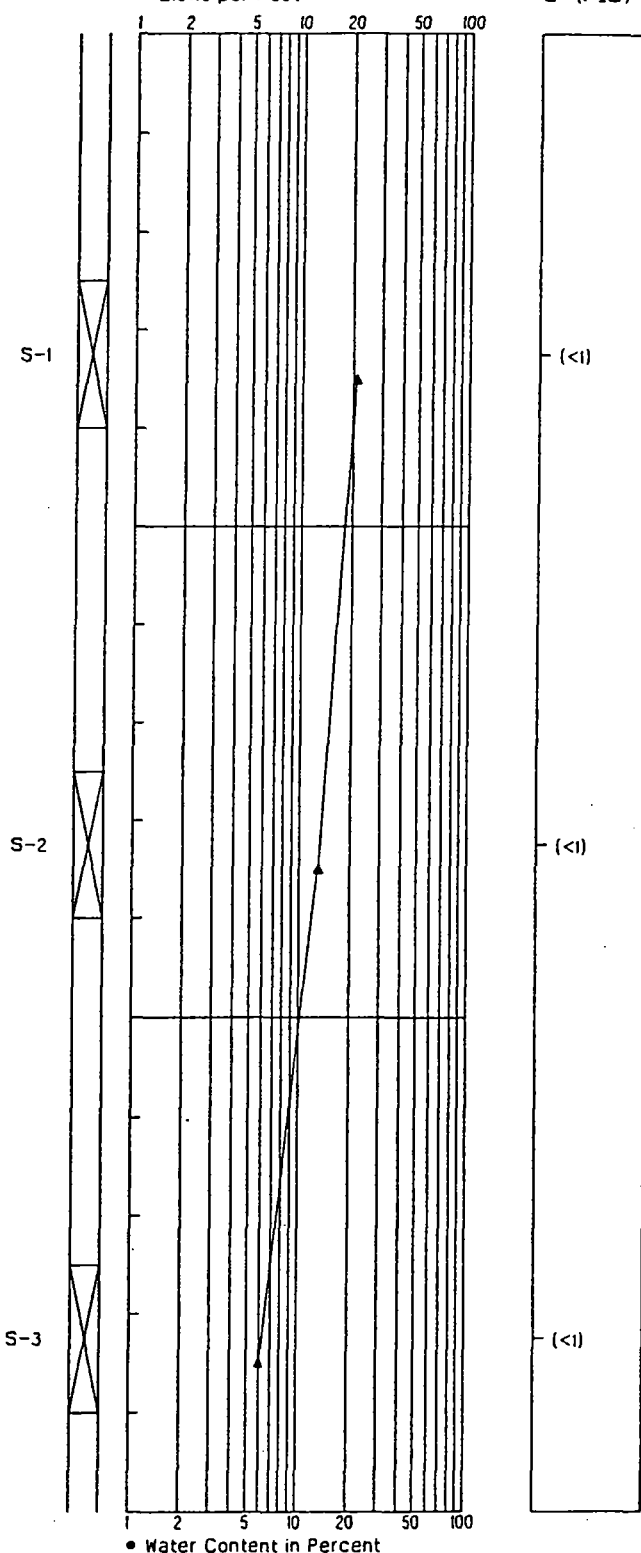


STANDARD PENETRATION RESISTANCE

▲ Blows per Foot

LAB
TESTS
& (PI0)

Sample



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.



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Figure A-3

Boring Log HC-3

Soil Descriptions

Ground Surface Elevation in ????

Depth
in Feet

2½ inches of ASPHALT over sandy
GRAVEL sub-base.

Loose to medium dense, moist to wet,
dark gray, fine SAND with occasional
fine sandy SILT zones.

Soft, damp to wet, brownish gray SILT
with scattered small root fragments.

Bottom of Boring at 14.0 Feet.
Completed 9/5/96.

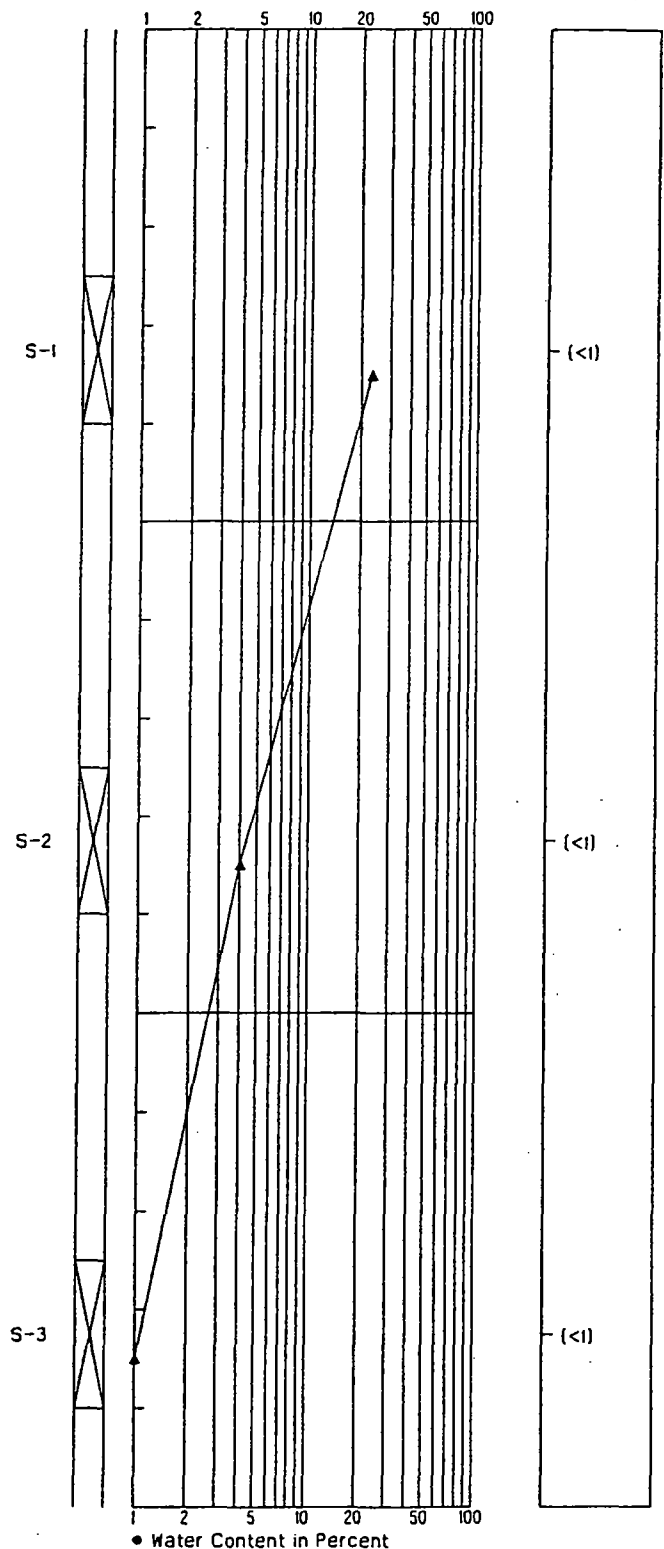
▽
ATO

Sample

STANDARD PENETRATION RESISTANCE

▲ Blows per Foot

LAB
TESTS
& (PID)



• Water Content in Percent

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.



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Figure A-4

Boring Log HC-4

Soil Descriptions

Ground Surface Elevation in ????

Depth
in Feet

1 1/2 inches of ASPHALT over sandy
GRAVEL sub-base

Loose, moist, brown to gray-brown, silty,
gravelly SAND with zones of assorted
debris including wood, metal, and
concrete.

Unidentified whitish material.

Very loose, wet, dark gray, silty, fine
SAND with strong petroleum-like odor.

Bottom of Boring at 14.0 Feet.
Completed 9/5/98.

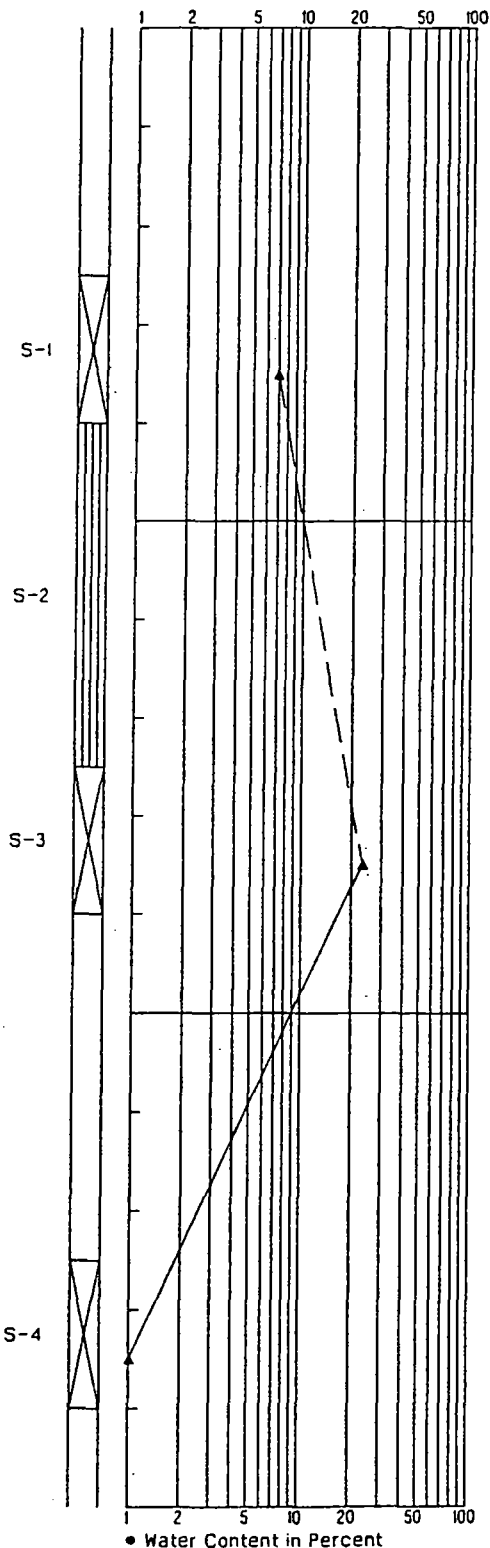
▽
ATO

STANDARD PENETRATION RESISTANCE

▲ Blows per Foot

LAB TESTS & (PID)

Sample



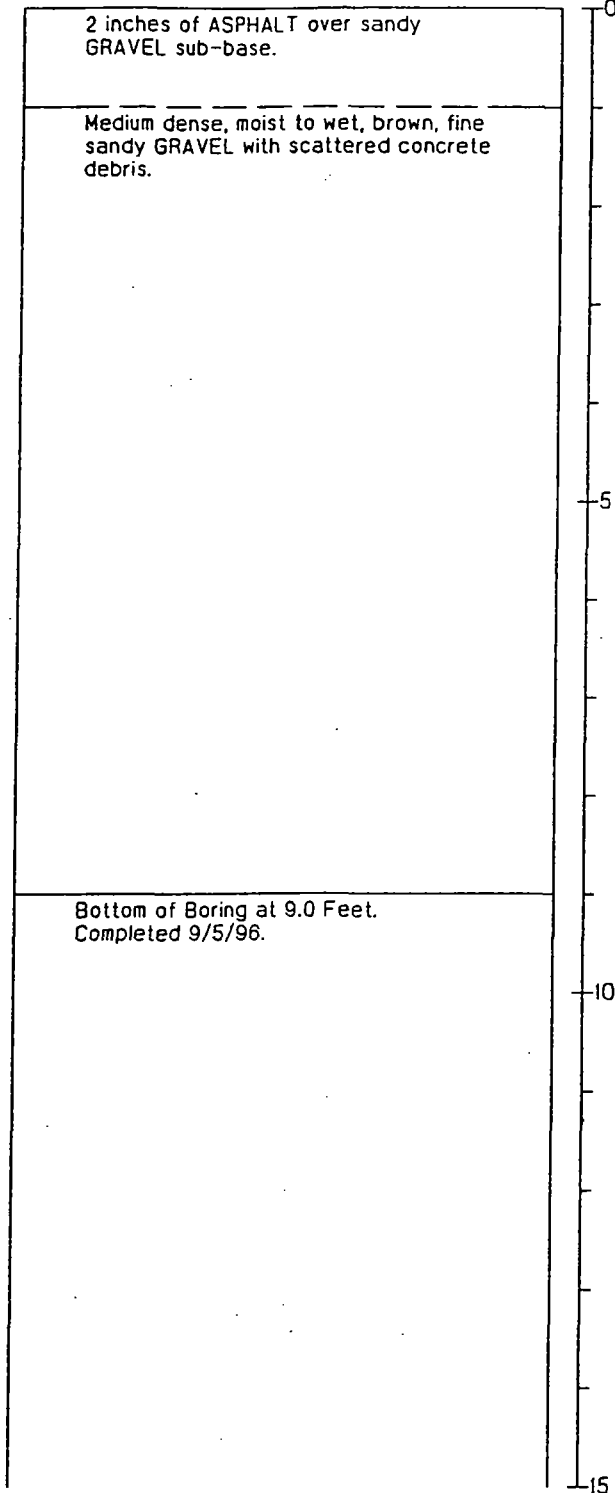
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATO) or for date specified. Level may vary with time.

Boring Log HC-5

Soil Descriptions

Ground Surface Elevation in ????

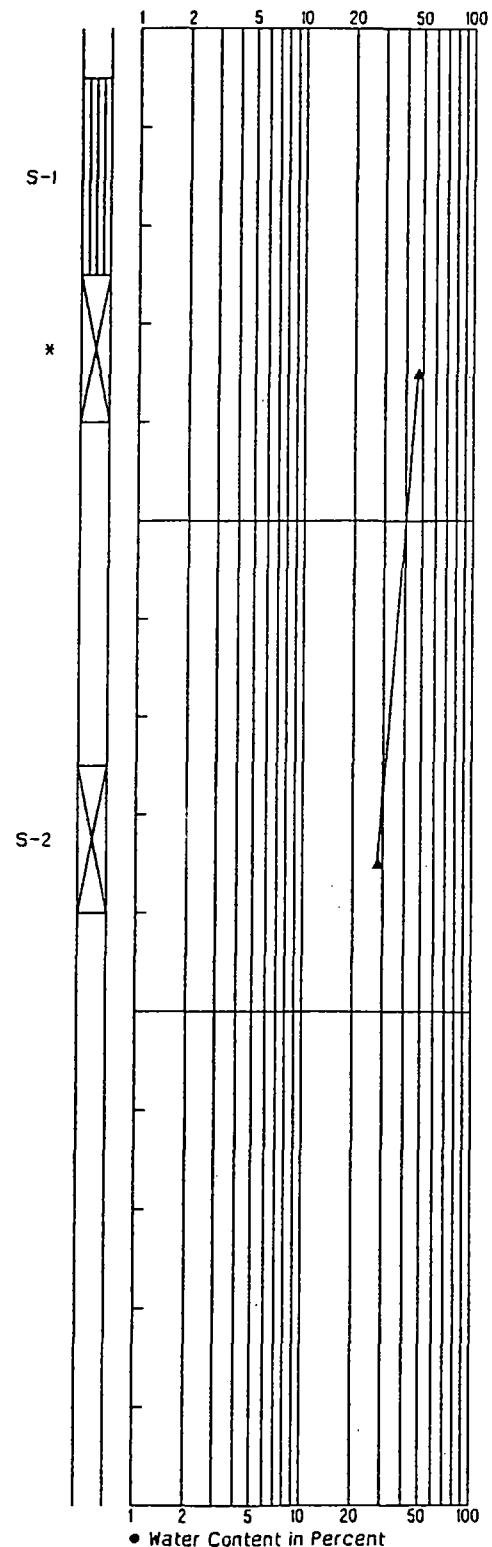
Depth
in Feet



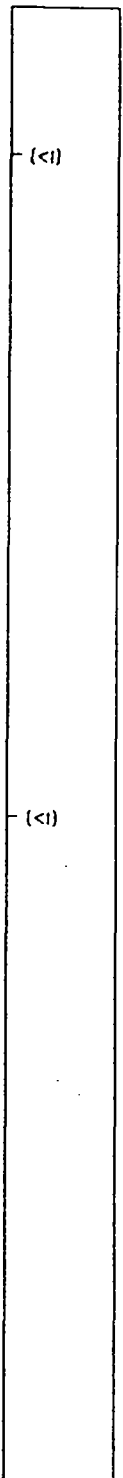
STANDARD PENETRATION RESISTANCE

▲ Blows per Foot

Sample



LAB TESTS & (PID)



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.



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Figure A-8

APPENDIX B
LABORATORY ANALYTICAL DATA QUALITY REVIEW
AND CHEMICAL LABORATORY REPORTS

**APPENDIX B
LABORATORY ANALYTICAL DATA QUALITY REVIEW
AND CHEMICAL LABORATORY REPORTS**

Data Validation

Eight soil samples were selected from the samples collected at the Fox Avenue property. The samples were submitted to the Hart Crowser Chemistry Laboratory and Analytical Resources, Inc. (ARI) of Seattle, Washington, on the day following collection and were analyzed for the following for various samples.

- ▶ Volatiles (EPA SW-846 Method 8260) by ARI;
- ▶ Total Metals (Cu, Pb, Cd, Ni, Zn, Fe, and Cr by Hart Crowser and Hg, Al, and As by ARI) (EPA 7000 Series);
- ▶ Total Petroleum Hydrocarbons (WTPH-HCID) by Hart Crowser and
- ▶ PCBs (EPA Method 8081) by Hart Crowser.

A standard data validation was performed on the original laboratory submitted certificates for all analyses by Hart Crowser, Inc. of Seattle Washington. This included a review of the:

- ▶ Holding times;
- ▶ Method Blanks;
- ▶ Surrogate percent recoveries;
- ▶ Matrix spike (MS or S) percent recoveries;
- ▶ Laboratory Control Samples (Blank spike) percent recoveries;
- ▶ Matrix spike duplicate (MSD) or duplicate (D) precision; and
- ▶ Quantitation limits or detection limits.

Methylene chloride was detected in the method blank. Concentrations reported for the project samples are qualified "B". No other data qualifiers were required for any of the other analyses based on our review of the laboratory data.

CHEMISTRY LABORATORY ANALYTICAL REPORT
HART CROWSER CHEMISTRY LABORATORY



HARTCROWSER

Earth and Environmental Technologies

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CHEMISTRY LABORATORY ANALYTICAL REPORT

September 30, 1996

Julie Wukelic, Senior Associate, Hart Crowser

RE: Fox Avenue Property, J-4618

Attached are the compiled results from analyses conducted on samples collected on September 6, 1996, and received on September 6, 1996. We performed extraction and analysis as indicated:

	Matrix	Quantity	Date Extracted	Date Analyzed
• TPH-HCID	Soil	9	9/9/96	9/9/96
• Cadmium (7130)	Soil	6	9/6/96	9/7/96
• Chromium (7190)	Soil	6	9/6/96	9/8/96
• Copper (7210)	Soil	6	9/6/96	9/7/96 and 9/27/96
• Iron (7380)	Soil	6	9/6/96	9/8/96
• Lead (7420)	Soil	6	9/6/96	9/7/96
• Nickel (7520)	Soil	6	9/6/96	9/8/96
• Zinc (7950)	Soil	6	9/6/96	9/7/96
• PCB (8081)	Soil	1	9/11/96	9/11/96



This report contains the following:

- Analytical results for soil samples presented on a dry weight basis.
- Data qualifiers.
- Results for method blank.
- Recoveries for laboratory control sample.
- Recoveries for matrix spiked samples.
- Differences for matrix spike duplicate analyses.
- Differences for analytical duplicate analyses.
- Recoveries for proficiency sample.
- Analytical reporting limits.
- QA/QC Control limits.
- Copies of Chain of Custody forms.

Analytical Comment

The copper Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries for the initial analysis of sample HC4-S4 are outside of control limits. The samples were re-homogenized, re-extracted, and re-analyzed. Re-analysis recoveries of MS and MSD are also outside of control limits. The sample matrix has variation in copper contamination.

The TPH HCID concentration in samples HC1-S3 and HC3-S1, and the PCB 8081 concentrations in sample HC4-S4 are less than five times the reporting limit. Relative percent differences are not calculated for these samples.

The method blank for zinc contains contamination above the reporting limit. However, the concentrations of zinc in the samples are greater than ten times the concentration in the method blank, thus requiring no qualification.

The iron and zinc concentrations in sample HC4-S4 are greater than five times the spike concentration. Recoveries are not calculated for the Matrix Spike (MS) and Matrix Spike Duplicate (MSD). Concentrations from the spiked samples are used to calculate Relative Percent Difference (RPD).



The following samples were analyzed, and results are presented in this report:

HC1 S2	HC3 S2
HC1 S3	HC4 S3
HC2 S1	HC4 S4
HC2 S2	HC5 S1
HC3 S1	HC5 S2

HART CROWSER, INC.

JAMES HERNDON
Laboratory Manager
Washington State Department of Ecology
Laboratory Accreditation Number C134
Corps of Engineers Validation 5/13/96



Analytical Results

Compound	HC1 S2	HC1 S3	Duplicate HC1 S3	HC2 S1
Matrix	Soil	Soil	Soil	Soil
% Moisture	16%	21%	21%	6%

Results in mg/kg (ppm)

TPH-HCID

Gasoline	10 U	10 U	n/t	10 U
Stoddard Solvent	10 U	10 U	n/t	10 U
Kensol	10 U	10 U	n/t	10 U
Kerosene/Jet A	10 U	10 U	n/t	10 U
Diesel/Fuel Oil #2	20 U	20 U	n/t	20 U
Bunker C	50 U	50 U	n/t	50 U
Oil	50 U	50 U	n/t	50 U
Unknown	10 U	10 U	n/t	10 U

Total TPH Concentration	-	-	-	-
2-Fluorobiphenyl (surr #1)	98%	97%		98%
o-Terphenyl (surr #2)	98%	97%		97%
Hexacosane - nC26 (surr #3)	96%	93%		94%

Results in mg/kg (ppm)

Flame AA

Cadmium	n/t	0.50 U	0.50 U	n/t
Chromium	n/t	3.2	3.2	n/t
Copper	n/t	7.1	6.3	n/t
Iron	n/t	3,100	3,300	n/t
Lead	n/t	5.0 U	5.0 U	n/t
Nickel	n/t	1.6 J	7.0	n/t
Zinc	n/t	9.4	9.2	n/t



Analytical Results, continued

Compound	HC2 S2	HC3 S1	Duplicate HC3 S1	HC3 S2
Matrix	Soil	Soil	Soil	Soil
% Moisture	26%	5%	5%	21%

Results in mg/kg (ppm)

TPH-HCID				
Gasoline	10 U	10 U	10 U	10 U
Stoddard Solvent	10 U	10 U	10 U	10 U
Kensol	10 U	10 U	10 U	10 U
Kerosene/Jet A	10 U	10 U	10 U	10 U
Diesel/Fuel Oil #2	20 U	20 U	20 U	20 U
Bunker C	50 U	50 U	50 U	50 U
Oil	50 U	50 U	50 U	50 U
Unknown	10 U	10 U	10 U	10 U
Total TPH Concentration	-	-	-	-
2-Fluorobiphenyl (surr #1)	98%	99%	98%	99%
o-Terphenyl (surr #2)	98%	99%	97%	98%
Hexacosane - nC26 (surr #3)	93%	93%	91%	91%

Results in mg/kg (ppm)

Flame AA				
Cadmium	0.50 U	n/t	n/t	0.50 U
Chromium	5.9	n/t	n/t	4.4
Copper	8.5	n/t	n/t	8.8
Iron	4,400	n/t	n/t	4,000
Lead	5.0 U	n/t	n/t	5.0 U
Nickel	4.9	n/t	n/t	4.5
Zinc	9.6	n/t	n/t	11



Analytical Results, continued

Compound	HC4 S3	HC4 S4	Duplicate HC4 S4	HC5 S1
Matrix	Soil	Soil	Soil	Soil
% Moisture	19%	23%	23%	7%

Results in mg/kg (ppm)

TPH-HCID				
Gasoline	10 U	10 U	n/t	10 U
Stoddard Solvent	20	10 U	n/t	10 U
Kensol	10 U	10 U	n/t	10 U
Kerosene/Jet A	10 U	10 U	n/t	10 U
Diesel/Fuel Oil #2	20 U	85	n/t	20 U
Bunker C	50 U	50 U	n/t	50 U
Oil	170	800	n/t	110
Unknown	10 U	10 U	n/t	10 U
Total TPH Concentration	190	885		110
2-Fluorobiphenyl (surr #1)	101%	101%		101%
o-Terphenyl (surr #2)	101%	101%		101%
Hexacosane - nC26 (surr #3)	96%	104%		102%

Results in mg/kg (ppm)

Flame AA				
Cadmium	1.8	0.50 U	n/t	n/t
Chromium	44	4.5	n/t	n/t
Copper	360	47	n/t	n/t
Iron	28,000	8,200	n/t	n/t
Lead	580	36	n/t	n/t
Nickel	76	9.7	n/t	n/t
Zinc	6,400	55	n/t	n/t



Analytical Results, continued

Compound	HC5 S2
Matrix	Soil
% Moisture	17%

Results in mg/kg (ppm)

Flame AA	
Cadmium	0.50 U
Chromium	8.5
Copper	24
Iron	8,200
Lead	5.0 U
Nickel	11
Zinc	32



Analytical Results, continued

Compound	HC4 S4	Duplicate
		HC4 S4
Matrix	Soil	Soil
% Moisture	23%	23%
Results in µg/kg (ppm)		
PCB (8081)		
A1016	200 U	200 U
A1221	500 U	500 U
A1232	500 U	500 U
A1242	200 U	200 U
A1248	200 U	200 U
A1254	200 U	200 U
A1260	200 U	200 U
Tetrachloro-m-xylene (surr)	81%	78%
Decachlorobiphenyl (surr)	90%	87%

Data Qualifiers

U	Not detected at the indicated reporting limit.
-	Below reporting limit.
J	Estimated value.
B	Also detected in associated method blank.
C	Co-elution interference.
M	Unable to report due to matrix interference.
n/t	Test not performed.
n/a	Not applicable.
Surr	Surrogate compound.
Dupl	Laboratory analytical duplicate.



Method Blank

Compound	
Matrix	Soil

Results in mg/kg (ppm)

TPH-HCID	09/09/96
Gasoline	10 U
Stoddard Solvent	10 U
Kensol	10 U
Kerosene/Jet A	10 U
Diesel/Fuel Oil #2	20 U
Bunker C	50 U
Oil	50 U
Unknown	10 U
Total TPH Concentration	-
2-Fluorobiphenyl (surr #1)	98%
o-Terphenyl (surr #2)	98%
Hexacosane - nC26 (surr #3)	97%

Results in mg/kg (ppm)

Flame AA	09/06/96
Cadmium	0.50 U
Chromium	1.5 U
Copper	1.0 U
Iron	2.5 U
Lead	5.0 U
Nickel	2.0 U
Zinc	0.30



Laboratory Control Sample

Compound	
Matrix	Soil

	% Recovery	
TPH-HCID		09/09/96
Kerosene/Jet A		92%
2-Fluorobiphenyl (surr #1)		90%
o-Terphenyl (surr #2)		99%
Hexacosane - nC26 (surr #3)		97%

	% Recovery	
Flame AA		09/06/96
Cadmium		97%
Chromium		88%
Copper		95%
Iron		97%
Lead		97%
Nickel		97%
Zinc		95%

	% Recovery	
PCB (8081)		09/11/96
A1242		91%
Tetrachloro-m-xylene (surr)		94%
Decachlorobiphenyl (surr)		104%



Matrix Spikes

Compound	MS HC2 S1	MSD HC2 S1	MS HC4 S4	MSD HC4 S4
Matrix	Soil	Soil	Soil	Soil
% Moisture	6%	6%	23%	23%

% Recovery

TPH-HCID

Kerosene/Jet A	98%	103%
2-Fluorobiphenyl (surr #1)	101%	100%
o-Terphenyl (surr #2)	97%	97%
Hexacosane - nC26 (surr #3)	94%	93%

% Recovery and concentration in mg/kg (ppm)

Flame AA		
Cadmium	104%	99%
Chromium	74%	74%
Copper	68%	42%
Iron	11,000	12,000
Lead	112%	120%
Nickel	94%	94%
Zinc	67	72



Relative Percent Difference for Duplicates

Compound	HC1 S3	HC2 S1	HC4 S4
Matrix	Soil	Soil	Soil

TPH-HCID

Kerosene/Jet A	5%
----------------	----

Flame AA

Cadmium		5%
Chromium		0%
Copper	12%	47%
Iron	6%	9%
Lead		7%
Nickel		0%
Zinc	2%	7%

Proficiency Sample Results

Compound	% Recovery	
	Buffalo River	#9502 ERA
Matrix	Soil	Soil

Flame AA

Cadmium	98%
Copper	87%
Lead	92%
Nickel	68%
Zinc	87%

PCB (8081)

A1254	69%
Tetrachloro-m-xylene (surr)	100%
Decachlorobiphenyl (surr)	102%



Analytical Reporting Limits

Limits in mg/kg (ppm)

TPH-HCID	Soil
Gasoline	10
Kensol	10
Kerosene/Jet A	10
Stoddard Solvent	10
Diesel/Fuel Oil #2	20
Bunker C	50
Oil	50
Unknown	10

Limits in mg/kg (ppm)

Metals by Flame AA	Soil
Cadmium	0.5
Chromium	1.5
Copper	1.0
Iron	2.5
Lead	5.0
Nickel	2.0
Silver	1.25
Zinc	0.25

Limits in $\mu\text{g/kg}$ (ppb)

PCBs 8081/608	Soil
A1016	200
A1221	500
A1232	500
A1242	200
A1248	200
A1254	200
A1260	200



QA/QC Control Limits

Method: TPH-HCID

Evaluation: 8/96

Parameter	LCL	UCL
Matrix	Soil	Soil
LCS	83%	110%
MS/MSD	45%	144%
MS/MSD (RPD)	0%	35%
Duplicate (RPD)	0%	38%

Surrogates

2-Fluorobiphenyl	88%	117%
o-Terphenyl	89%	118%
Hexacosane	89%	122%

LCL - lower control limit (mean minus 3s)

UCL - upper control limit (mean plus 3s)

s - standard deviation



QA/QC Control Limits, continued

Method: Metals by Flame AA

Evaluation: 8/96

Parameter	LCL	UCL
Matrix	Soil	Soil

LCS

Cadmium (Cd)	78%	109%
Lead (Pb)	84%	101%

MS/MSD

Cadmium (Cd)	N/A	N/A
Lead (Pb)	72%	109%

MS/MSD (RPD)

Cadmium (Cd)	0%	N/A
Lead (Pb)	0%	36%

Buffalo River Sediment

Cadmium (Cd)	N/A	N/A
Lead (Pb)	75%	105%

N/A - not available due to insufficient database.

LCL - lower control limit (mean minus 3s)

UCL - upper control limit (mean plus 3s)

s - standard deviation



QA/QC Control Limits, continued

Method: PCBs (8081/608)

Evaluation: 8/96

Parameter	LCL	UCL
Matrix	Soil	Soil
LCS	56%	142%
MS/MSD	69%	160%
MS/MSD (RPD)	0%	N/A
Duplicate (RPD)	0%	N/A

Surrogates

Tetrachloro-m-xylene	46%	133%
Decachlorobiphenyl	53%	134%

N/A - not available due to insufficient database.

LCL - lower control limit (mean minus 3s)

UCL - upper control limit (mean plus 3s)

s - standard deviation

Sample Custody Record

DATE 9-5-96


PAGE 2 OF 2



Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699

JOB NUMBER <u>J-4618</u> LAB NUMBER _____					TESTING										NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PROJECT MANAGER <u>WUK</u>					WTPH - HEAD (HC)	METALS (Cd, Cu, Cr, Pb, Ni, Zn, Fe)	PCBS (HC)	Hg # AI, As (AIC)	S260 (ARE)	MOISTURE (HC)						
PROJECT NAME <u>FOX AVE. PROPERTY</u>																
SAMPLED BY: <u>Bruce J. McDonald</u>																
LAB NO.	SAMPLE	TIME	STATION	MATRIX												
	S-1	2047	HC-4	SOIL									2			
	S-2	2052	HC-4	"	X								1	GRAB sample, For visual		
	S-3	2057	HC-4	"	X	X							2			
	S-4	2110	HC-4	"	X	X	X						2			
	S-1	2213	HC-5	"	X								2			
	S-2	2222	HC-5	"		X							2			
	S-1	2256	HC-3	"	X								2			
	S-2	2300	HC-3	"	X	X							2			
	S-3	2305	HC-3	"									2			
	S-1	2355	HC-2	"	X								2			
	S-2	2400	HC-2	"	X	X							2			
	S-3	2407	HC-2	"									2			
RELINQUISHED BY <u>Bruce J. McDonald</u>		DATE <u>9/6/96</u>	RECEIVED BY <u>James Herndon</u>		DATE <u>9/6/96</u>		TOTAL NUMBER OF CONTAINERS <u>29</u>					METHOD OF SHIPMENT <u>HAND DELIVERED</u>				
SIGNATURE <u>BRUCE D. McDOWALD</u>		TIME <u>1715</u>	SIGNATURE <u>JAMES HERNDON</u>		TIME <u>14:20</u>		SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS <u>Jar for HC4-S2 plastic - not paper type for analysis. Change made as per conversation with WUK 9/6/96 14:15 JEH</u>									
PRINTED NAME <u>HART CROWSER</u>			PRINTED NAME <u>HVC</u>													
COMPANY			COMPANY													
RELINQUISHED BY		DATE	RECEIVED BY		DATE		DISTRIBUTION:									
SIGNATURE			SIGNATURE				1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY									
TIME			TIME				2. RETURN PINK COPY TO PROJECT MANAGER									
PRINTED NAME			PRINTED NAME				3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT									
COMPANY			COMPANY				4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER									

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699

 Printed On Recycled Paper

LABORATORY ANALYTICAL RESULTS
ANALYTICAL RESOURCES, INC.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

16 September 1996

Jack Herndon
Hart Crowser, Inc.
1910 Fairview Ave. East
Seattle, WA 98102

**RE: Client Project: J4618, "Fox Ave. Property";
ARI Job #Q046**

Dear Mr. Herndon,

Please find enclosed the original chain-of-custody (COC) record and results for samples from the above-referenced project. Six soil samples were received in good condition on 9/6/96. There were no discrepancies between the COC and sample container labels, and they were logged into the laboratory without incident of note.

The metals and volatile organics analyses were routine, and preliminary results were faxed to you as soon as they became available. Sample **HC4-S3** for volatiles required reanalysis using a smaller sample amount because the concentration of tetrachloroethene was above the linear range of instrument calibration; both sets of results are reported.

Sample **HC4-S3** was used as a QC sample for volatiles; a matrix spike/matrix spike duplicate report is included as documentation. Laboratory Control Samples were prepped and analyzed for both parameters, and recovery results are reported, following the associated method blank results, as additional QC for the project.

A copy of this package will be kept on file by ARI should you required further information or copies of any documentation. Also, if you have questions please feel free to call any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Manager
206-340-2866, ext. 117

Enclosures
cc: file #Q046

Samples Shipped to: ARF

Qc 46

96-14766 -14771



HARTCROWSER

Hart Crowser, Inc.

1910 Fairview Avenue East

Seattle, Washington 98102-3699

Phone: 206-342-9530 FAX: 206-328-5581

[illegible]

White and Yellow Copies to Lab

Pink to Project Manager

Lab to Return White Copy to Hart Crowser

Normalcy is back!



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC1-S3

Lab Sample ID: Q046F
LIMS ID: 96-14771
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Sampled:
Date Received: 09/06/96

Data Release Authorized: *CT*
Reported: 09/13/96

Percent Total Solids: 77.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	3	8,180
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	6	6 U
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.06	0.06 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL
RESOURCES
INCORPORATEDINORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC2-S2

Lab Sample ID: Q046E
LIMS ID: 96-14770
Matrix: SoilQC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618Date Sampled:
Date Received: 09/06/96Data Release Authorized: *CR*
Reported: 09/13/96

Percent Total Solids: 75.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	3	12,400
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	6	6 U
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC3-S2

Lab Sample ID: Q046D
LIMS ID: 96-14769
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Sampled:
Date Received: 09/06/96

Data Release Authorized: *CT*
Reported: 09/13/96

Percent Total Solids: 78.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	2	12,000
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	6	6 U
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.06	0.06 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC4-S3

Lab Sample ID: Q046A

LIMS ID: 96-14766

Matrix: Soil

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Sampled:

Date Received: 09/06/96

Data Release Authorized: *CTy*

Reported: 09/13/96

Percent Total Solids: 73.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	3	12,300
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	7	26
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.07	0.41

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC4-S4

Lab Sample ID: Q046B
LIMS ID: 96-14767
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Sampled:
Date Received: 09/06/96

Data Release Authorized: *CTy*
Reported: 09/13/96

Percent Total Solids: 75.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	3	9,620
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	6	6 U
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.06	0.29

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: HC5-S2

Lab Sample ID: Q046C
LIMS ID: 96-14768
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Sampled:
Date Received: 09/06/96

Data Release Authorized: *CT*
Reported: 09/13/96

Percent Total Solids: 80.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	2	16,500
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	6	6 U
CLP	09/09/96	7471	09/11/96	7439-97-6	Mercury	0.06	0.06 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: Q046MB
LIMS ID: 96-14766
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Sampled: NA
Date Received: NA

Data Release Authorized: *CS*
Reported: 09/13/96

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/09/96	6010	09/10/96	7429-90-5	Aluminum	2	3
3050	09/09/96	6010	09/10/96	7440-38-2	Arsenic	5	5 U
CLP	09/09/96	7470	09/11/96	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Lab Sample ID: Q046LCS
LIMS ID: 96-14766
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Data Release Authorized: *CS*
Reported: 09/13/96

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	259	250	103.6%	
Arsenic	6010	253	250	101.2%	
Mercury	7471	0.40	0.50	80.0%	

'Q' codes: N = control limit not met

Control Limits: 75-125%

FORM-VII

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
Page 1 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC1-S3

Lab Sample ID: Q046F

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14771

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *SPB*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.90 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 23.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.6 U
74-83-9	Bromomethane	2.6 U
75-01-4	Vinyl Chloride	2.6 U
75-00-3	Chloroethane	2.6 U
75-09-2	Methylene Chloride	3.2 B
67-64-1	Acetone	13
75-15-0	Carbon Disulfide	1.3 U
75-35-4	1,1-Dichloroethene	1.3 U
75-34-3	1,1-Dichloroethane	1.3 U
156-60-5	trans-1,2-Dichloroethene	1.3 U
156-59-2	cis-1,2-Dichloroethene	3.7
67-66-3	Chloroform	1.3 U
107-06-2	1,2-Dichloroethane	1.3 U
78-93-3	2-Butanone	6.4 U
71-55-6	1,1,1-Trichloroethane	1.3 U
56-23-5	Carbon Tetrachloride	1.3 U
108-05-4	Vinyl Acetate	6.4 U
75-27-4	Bromodichloromethane	1.3 U
78-87-5	1,2-Dichloropropane	1.3 U
10061-01-5	cis-1,3-Dichloropropene	1.3 U
79-01-6	Trichloroethene	14
124-48-1	Dibromochloromethane	1.3 U
79-00-5	1,1,2-Trichloroethane	1.3 U
71-43-2	Benzene	1.3 U
10061-02-6	trans-1,3-Dichloropropene	1.3 U
110-75-8	2-Chloroethylvinylether	6.4 U
75-25-2	Bromoform	1.3 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.4 U
591-78-6	2-Hexanone	6.4 U
127-18-4	Tetrachloroethene	120
79-34-5	1,1,2,2-Tetrachloroethane	1.3 U
108-88-3	Toluene	1.3 U
108-90-7	Chlorobenzene	1.3 U
100-41-4	Ethylbenzene	1.3 U
100-42-5	Styrene	1.3 U
75-69-4	Trichlorofluoromethane	2.6 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.6 U
	m,p-Xylene	1.3 U



Sample No: HC1-S3

Lab Sample ID: Q046F

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14771

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *CHS*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.90 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 23.6%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.3 U
95-50-1	1,2-Dichlorobenzene	1.3 U
541-73-1	1,3-Dichlorobenzene	1.3 U
106-46-7	1,4-Dichlorobenzene	1.3 U
107-02-8	Acrolein	64 U
74-88-4	Methyl Iodide	1.3 U
74-96-4	Bromoethane	2.6 U
107-13-1	Acrylonitrile	6.4 U
563-58-6	1,1-Dichloropropene	1.3 U
74-95-3	Dibromomethane	1.3 U
630-20-6	1,1,1,2-Tetrachloroethane	1.3 U
96-12-8	1,2-Dibromo-3-chloropropane	6.4 U
96-18-4	1,2,3-Trichloropropane	1.3 U
110-57-6	trans-1,4-Dichloro-2-butene	13 Y
108-67-8	1,3,5-Trimethylbenzene	1.3 U
95-63-6	1,2,4-Trimethylbenzene	1.3 U
87-68-3	Hexachlorobutadiene	6.4 U
106-93-4	Ethylene Dibromide	1.3 U
74-97-5	Bromochloromethane	1.3 U
590-20-7	2,2-Dichloropropane	1.3 U
142-28-9	1,3-Dichloropropane	1.3 U
98-82-8	Isopropylbenzene	1.3 U
103-65-1	n-Propylbenzene	1.3 U
108-86-1	Bromobenzene	1.3 U
95-49-8	2-Chlorotoluene	1.3 U
106-43-4	4-Chlorotoluene	1.3 U
98-06-6	tert-Butylbenzene	1.3 U
135-98-8	sec-Butylbenzene	1.3 U
99-87-6	4-Isopropyltoluene	1.3 U
104-51-8	n-Butylbenzene	1.3 U
120-82-1	1,2,4-Trichlorobenzene	6.4 U
91-20-3	Naphthalene	6.4 U
87-61-6	1,2,3-Trichlorobenzene	6.4 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	97.0%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	99.3%



Sample No: HC2-S2

Lab Sample ID: Q046E

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14770

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *RB*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.73 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 26.1%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.7 U
74-83-9	Bromomethane	2.7 U
75-01-4	Vinyl Chloride	2.7 U
75-00-3	Chloroethane	2.7 U
75-09-2	Methylene Chloride	3.0 B
67-64-1	Acetone	6.7 U
75-15-0	Carbon Disulfide	1.3 U
75-35-4	1,1-Dichloroethene	1.3 U
75-34-3	1,1-Dichloroethane	1.3 U
156-60-5	trans-1,2-Dichloroethene	1.3 U
156-59-2	cis-1,2-Dichloroethene	1.3 U
67-66-3	Chloroform	1.3 U
107-06-2	1,2-Dichloroethane	1.3 U
78-93-3	2-Butanone	6.7 U
71-55-6	1,1,1-Trichloroethane	1.3 U
56-23-5	Carbon Tetrachloride	1.3 U
108-05-4	Vinyl Acetate	6.7 U
75-27-4	Bromodichloromethane	1.3 U
78-87-5	1,2-Dichloropropane	1.3 U
10061-01-5	cis-1,3-Dichloropropene	1.3 U
79-01-6	Trichloroethene	1.3 U
124-48-1	Dibromochloromethane	1.3 U
79-00-5	1,1,2-Trichloroethane	1.3 U
71-43-2	Benzene	1.3 U
10061-02-6	trans-1,3-Dichloropropene	1.3 U
110-75-8	2-Chloroethylvinylether	6.7 U
75-25-2	Bromoform	1.3 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.7 U
591-78-6	2-Hexanone	6.7 U
127-18-4	Tetrachloroethene	9.1
79-34-5	1,1,2,2-Tetrachloroethane	1.3 U
108-88-3	Toluene	1.3 U
108-90-7	Chlorobenzene	1.3 U
100-41-4	Ethylbenzene	1.3 U
100-42-5	Styrene	1.3 U
75-69-4	Trichlorofluoromethane	2.7 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.7 U
	m,p-Xylene	1.3 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
Page 2 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC2-S2

Lab Sample ID: Q046E

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14770

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *MP*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.73 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 26.1%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.3 U
95-50-1	1,2-Dichlorobenzene	1.3 U
541-73-1	1,3-Dichlorobenzene	1.3 U
106-46-7	1,4-Dichlorobenzene	1.3 U
107-02-8	Acrolein	67 U
74-88-4	Methyl Iodide	1.3 U
74-96-4	Bromoethane	2.7 U
107-13-1	Acrylonitrile	6.7 U
563-58-6	1,1-Dichloropropene	1.3 U
74-95-3	Dibromomethane	1.3 U
630-20-6	1,1,1,2-Tetrachloroethane	1.3 U
96-12-8	1,2-Dibromo-3-chloropropane	6.7 U
96-18-4	1,2,3-Trichloropropane	1.3 U
110-57-6	trans-1,4-Dichloro-2-butene	13 Y
108-67-8	1,3,5-Trimethylbenzene	1.3 U
95-63-6	1,2,4-Trimethylbenzene	1.3 U
87-68-3	Hexachlorobutadiene	6.7 U
106-93-4	Ethylene Dibromide	1.3 U
74-97-5	Bromochloromethane	1.3 U
590-20-7	2,2-Dichloropropane	1.3 U
142-28-9	1,3-Dichloropropane	1.3 U
98-82-8	Isopropylbenzene	1.3 U
103-65-1	n-Propylbenzene	1.3 U
108-86-1	Bromobenzene	1.3 U
95-49-8	2-Chlorotoluene	1.3 U
106-43-4	4-Chlorotoluene	1.3 U
98-06-6	tert-Butylbenzene	1.3 U
135-98-8	sec-Butylbenzene	1.3 U
99-87-6	4-Isopropyltoluene	1.3 U
104-51-8	n-Butylbenzene	1.3 U
120-82-1	1,2,4-Trichlorobenzene	6.7 U
91-20-3	Naphthalene	6.7 U
87-61-6	1,2,3-Trichlorobenzene	6.7 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.6%
Bromofluorobenzene	98.7%
d4-1,2-Dichlorobenzene	97.8%



Sample No: HC2-S2

Lab Sample ID: Q046E

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14770

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *SNB*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.73 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 26.1%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.3 U
95-50-1	1,2-Dichlorobenzene	1.3 U
541-73-1	1,3-Dichlorobenzene	1.3 U
106-46-7	1,4-Dichlorobenzene	1.3 U
107-02-8	Acrolein	67 U
74-88-4	Methyl Iodide	1.3 U
74-96-4	Bromoethane	2.7 U
107-13-1	Acrylonitrile	6.7 U
563-58-6	1,1-Dichloropropene	1.3 U
74-95-3	Dibromomethane	1.3 U
630-20-6	1,1,1,2-Tetrachloroethane	1.3 U
96-12-8	1,2-Dibromo-3-chloropropane	6.7 U
96-18-4	1,2,3-Trichloropropane	1.3 U
110-57-6	trans-1,4-Dichloro-2-butene	13 Y
108-67-8	1,3,5-Trimethylbenzene	1.3 U
95-63-6	1,2,4-Trimethylbenzene	1.3 U
87-68-3	Hexachlorobutadiene	6.7 U
106-93-4	Ethylene Dibromide	1.3 U
74-97-5	Bromochloromethane	1.3 U
590-20-7	2,2-Dichloropropane	1.3 U
142-28-9	1,3-Dichloropropane	1.3 U
98-82-8	Isopropylbenzene	1.3 U
103-65-1	n-Propylbenzene	1.3 U
108-86-1	Bromobenzene	1.3 U
95-49-8	2-Chlorotoluene	1.3 U
106-43-4	4-Chlorotoluene	1.3 U
98-06-6	tert-Butylbenzene	1.3 U
135-98-8	sec-Butylbenzene	1.3 U
99-87-6	4-Isopropyltoluene	1.3 U
104-51-8	n-Butylbenzene	1.3 U
120-82-1	1,2,4-Trichlorobenzene	6.7 U
91-20-3	Naphthalene	6.7 U
87-61-6	1,2,3-Trichlorobenzene	6.7 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.6%
Bromofluorobenzene	98.7%
d4-1,2-Dichlorobenzene	97.8%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC3-S2

Lab Sample ID: Q046D

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14769

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *Q123*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 4.03 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 19.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.5 U
74-83-9	Bromomethane	2.5 U
75-01-4	Vinyl Chloride	2.5 U
75-00-3	Chloroethane	2.5 U
75-09-2	Methylene Chloride	3.0 B
67-64-1	Acetone	49
75-15-0	Carbon Disulfide	1.2 U
75-35-4	1,1-Dichloroethene	1.2 U
75-34-3	1,1-Dichloroethane	1.2 U
156-60-5	trans-1,2-Dichloroethene	1.2 U
156-59-2	cis-1,2-Dichloroethene	1.2 U
67-66-3	Chloroform	1.2 U
107-06-2	1,2-Dichloroethane	1.2 U
78-93-3	2-Butanone	6.2 U
71-55-6	1,1,1-Trichloroethane	1.2 U
56-23-5	Carbon Tetrachloride	1.2 U
108-05-4	Vinyl Acetate	6.2 U
75-27-4	Bromodichloromethane	1.2 U
78-87-5	1,2-Dichloropropane	1.2 U
10061-01-5	cis-1,3-Dichloropropene	1.2 U
79-01-6	Trichloroethene	1.2 U
124-48-1	Dibromochloromethane	1.2 U
79-00-5	1,1,2-Trichloroethane	1.2 U
71-43-2	Benzene	1.2 U
10061-02-6	trans-1,3-Dichloropropene	1.2 U
110-75-8	2-Chloroethylvinylether	6.2 U
75-25-2	Bromoform	1.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.2 U
591-78-6	2-Hexanone	6.2 U
127-18-4	Tetrachloroethene	1.2 U
79-34-5	1,1,2,2-Tetrachloroethane	1.2 U
108-88-3	Toluene	1.2 U
108-90-7	Chlorobenzene	1.2 U
100-41-4	Ethylbenzene	1.2 U
100-42-5	Styrene	1.2 U
75-69-4	Trichlorofluoromethane	2.5 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.5 U
	m,p-Xylene	1.2 U



Sample No: HC3-S2

Lab Sample ID: Q046D

LIMS ID: 96-14769

Matrix: Soil

Data Release Authorized: *BP*

Reported: 09/12/96

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Sampled:

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 4.03 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 19.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.2 U
95-50-1	1,2-Dichlorobenzene	1.2 U
541-73-1	1,3-Dichlorobenzene	1.2 U
106-46-7	1,4-Dichlorobenzene	1.2 U
107-02-8	Acrolein	62 U
74-88-4	Methyl Iodide	1.2 U
74-96-4	Bromoethane	2.5 U
107-13-1	Acrylonitrile	6.2 U
563-58-6	1,1-Dichloropropene	1.2 U
74-95-3	Dibromomethane	1.2 U
630-20-6	1,1,1,2-Tetrachloroethane	1.2 U
96-12-8	1,2-Dibromo-3-chloropropane	6.2 U
96-18-4	1,2,3-Trichloropropane	1.2 U
110-57-6	trans-1,4-Dichloro-2-butene	12 Y
108-67-8	1,3,5-Trimethylbenzene	1.2 U
95-63-6	1,2,4-Trimethylbenzene	1.2 U
87-68-3	Hexachlorobutadiene	6.2 U
106-93-4	Ethylene Dibromide	1.2 U
74-97-5	Bromochloromethane	1.2 U
590-20-7	2,2-Dichloropropane	1.2 U
142-28-9	1,3-Dichloropropane	1.2 U
98-82-8	Isopropylbenzene	1.2 U
103-65-1	n-Propylbenzene	1.2 U
108-86-1	Bromobenzene	1.2 U
95-49-8	2-Chlorotoluene	1.2 U
106-43-4	4-Chlorotoluene	1.2 U
98-06-6	tert-Butylbenzene	1.2 U
135-98-8	sec-Butylbenzene	1.2 U
99-87-6	4-Isopropyltoluene	1.2 U
104-51-8	n-Butylbenzene	1.2 U
120-82-1	1,2,4-Trichlorobenzene	6.2 U
91-20-3	Naphthalene	6.2 U
87-61-6	1,2,3-Trichlorobenzene	6.2 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	97.5%
Bromofluorobenzene	98.4%
d4-1,2-Dichlorobenzene	97.6%

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Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3

Lab Sample ID: Q046A

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *[Signature]*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.62 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.8 U
74-83-9	Bromomethane	2.8 U
75-01-4	Vinyl Chloride	2.8 U
75-00-3	Chloroethane	2.8 U
75-09-2	Methylene Chloride	3.8 B
67-64-1	Acetone	38
75-15-0	Carbon Disulfide	2.9
75-35-4	1,1-Dichloroethene	1.4 U
75-34-3	1,1-Dichloroethane	1.4 U
156-60-5	trans-1,2-Dichloroethene	3.4
156-59-2	cis-1,2-Dichloroethene	80
67-66-3	Chloroform	1.4 U
107-06-2	1,2-Dichloroethane	1.4 U
78-93-3	2-Butanone	6.9 U
71-55-6	1,1,1-Trichloroethane	1.4 U
56-23-5	Carbon Tetrachloride	1.4 U
108-05-4	Vinyl Acetate	6.9 U
75-27-4	Bromodichloromethane	1.4 U
78-87-5	1,2-Dichloropropane	1.4 U
10061-01-5	cis-1,3-Dichloropropene	1.4 U
79-01-6	Trichloroethene	68
124-48-1	Dibromochloromethane	1.4 U
79-00-5	1,1,2-Trichloroethane	1.4 U
71-43-2	Benzene	1.4 U
10061-02-6	trans-1,3-Dichloropropene	1.4 U
110-75-8	2-Chloroethylvinylether	6.9 U
75-25-2	Bromoform	1.4 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.9 U
591-78-6	2-Hexanone	6.9 U
127-18-4	Tetrachloroethene	360 E
79-34-5	1,1,2,2-Tetrachloroethane	1.4 U
108-88-3	Toluene	1.4 U
108-90-7	Chlorobenzene	1.4 U
100-41-4	Ethylbenzene	1.4 U
100-42-5	Styrene	1.4 U
75-69-4	Trichlorofluoromethane	2.8 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.8 U
	m,p-Xylene	1.4 U

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Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3

Lab Sample ID: Q046A

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *[Signature]*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.62 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.6 M
95-50-1	1,2-Dichlorobenzene	1.4 U
541-73-1	1,3-Dichlorobenzene	1.4 U
106-46-7	1,4-Dichlorobenzene	1.4 U
107-02-8	Acrolein	69 U
74-88-4	Methyl Iodide	1.4 U
74-96-4	Bromoethane	2.8 U
107-13-1	Acrylonitrile	6.9 U
563-58-6	1,1-Dichloropropene	1.4 U
74-95-3	Dibromomethane	1.4 U
630-20-6	1,1,1,2-Tetrachloroethane	1.4 U
96-12-8	1,2-Dibromo-3-chloropropane	6.9 U
96-18-4	1,2,3-Trichloropropane	1.4 U
110-57-6	trans-1,4-Dichloro-2-butene	14 Y
108-67-8	1,3,5-Trimethylbenzene	16
95-63-6	1,2,4-Trimethylbenzene	35
87-68-3	Hexachlorobutadiene	6.9 U
106-93-4	Ethylene Dibromide	1.4 U
74-97-5	Bromochloromethane	1.4 U
590-20-7	2,2-Dichloropropane	1.4 U
142-28-9	1,3-Dichloropropane	1.4 U
98-82-8	Isopropylbenzene	1.4
103-65-1	n-Propylbenzene	1.4 U
108-86-1	Bromobenzene	1.4 U
95-49-8	2-Chlorotoluene	1.4 U
106-43-4	4-Chlorotoluene	1.4 U
98-06-6	tert-Butylbenzene	1.4 U
135-98-8	sec-Butylbenzene	5.0
99-87-6	4-Isopropyltoluene	6.2
104-51-8	n-Butylbenzene	2.8
120-82-1	1,2,4-Trichlorobenzene	6.9 U
91-20-3	Naphthalene	8.9
87-61-6	1,2,3-Trichlorobenzene	6.9 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	94.6%
Bromofluorobenzene	88.6%
d4-1,2-Dichlorobenzene	96.8%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3
REANALYSIS

Lab Sample ID: Q046A-RE QC Report No: Q046-Hart Crowser
LIMS ID: 96-14766 Project: Fox Ave Property
Matrix: Soil J-4618
Data Release Authorized: *APJ* Date Sampled:
Reported: 09/12/96 Date Received: 09/06/96

Instrument: FINN1 Sample Amount: 0.55 g dry Wt
Date Analyzed: 09/10/96 Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	18 U
74-83-9	Bromomethane	18 U
75-01-4	Vinyl Chloride	18 U
75-00-3	Chloroethane	18 U
75-09-2	Methylene Chloride	22 B
67-64-1	Acetone	82 B
75-15-0	Carbon Disulfide	9.1 U
75-35-4	1,1-Dichloroethene	9.1 U
75-34-3	1,1-Dichloroethane	9.1 U
156-60-5	trans-1,2-Dichloroethene	9.1 U
156-59-2	cis-1,2-Dichloroethene	59
67-66-3	Chloroform	9.1 U
107-06-2	1,2-Dichloroethane	9.1 U
78-93-3	2-Butanone	45 U
71-55-6	1,1,1-Trichloroethane	9.1 U
56-23-5	Carbon Tetrachloride	9.1 U
108-05-4	Vinyl Acetate	45 U
75-27-4	Bromodichloromethane	9.1 U
78-87-5	1,2-Dichloropropane	9.1 U
10061-01-5	cis-1,3-Dichloropropene	9.1 U
79-01-6	Trichloroethene	56
124-48-1	Dibromochloromethane	9.1 U
79-00-5	1,1,2-Trichloroethane	9.1 U
71-43-2	Benzene	9.1 U
10061-02-6	trans-1,3-Dichloropropene	9.1 U
110-75-8	2-Chloroethylvinylether	45 U
75-25-2	Bromoform	9.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	45 U
591-78-6	2-Hexanone	45 U
127-18-4	Tetrachloroethene	330
79-34-5	1,1,2,2-Tetrachloroethane	9.1 U
108-88-3	Toluene	9.1 U
108-90-7	Chlorobenzene	9.1 U
100-41-4	Ethylbenzene	9.1 U
100-42-5	Styrene	9.1 U
75-69-4	Trichlorofluoromethane	18 U
76-13-1	1,1,2-Trichlorotrifluoroethane	18 U
	m,p-Xylene	9.1 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3
REANALYSIS

Lab Sample ID: Q046A-RE QC Report No: Q046-Hart Crowser
LIMS ID: 96-14766 Project: Fox Ave Property
Matrix: Soil J-4618
Data Release Authorized: *SPB* Date Sampled:
Reported: 09/12/96 Date Received: 09/06/96

Instrument: FINN1 Sample Amount: 0.55 g dry Wt
Date Analyzed: 09/10/96 Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	9.1 U
95-50-1	1,2-Dichlorobenzene	9.1 U
541-73-1	1,3-Dichlorobenzene	9.1 U
106-46-7	1,4-Dichlorobenzene	9.1 U
107-02-8	Acrolein	450 U
74-88-4	Methyl Iodide	9.1 U
74-96-4	Bromoethane	18 U
107-13-1	Acrylonitrile	45 U
563-58-6	1,1-Dichloropropene	9.1 U
74-95-3	Dibromomethane	9.1 U
630-20-6	1,1,1,2-Tetrachloroethane	9.1 U
96-12-8	1,2-Dibromo-3-chloropropane	45 U
96-18-4	1,2,3-Trichloropropane	9.1 U
110-57-6	trans-1,4-Dichloro-2-butene	91 Y
108-67-8	1,3,5-Trimethylbenzene	21
95-63-6	1,2,4-Trimethylbenzene	41
87-68-3	Hexachlorobutadiene	45 U
106-93-4	Ethylene Dibromide	9.1 U
74-97-5	Bromochloromethane	9.1 U
590-20-7	2,2-Dichloropropane	9.1 U
142-28-9	1,3-Dichloropropane	9.1 U
98-82-8	Isopropylbenzene	9.1 U
103-65-1	n-Propylbenzene	9.1 U
108-86-1	Bromobenzene	9.1 U
95-49-8	2-Chlorotoluene	9.1 U
106-43-4	4-Chlorotoluene	9.1 U
98-06-6	tert-Butylbenzene	9.1 U
135-98-8	sec-Butylbenzene	9.1 U
99-87-6	4-Isopropyltoluene	9.1 U
104-51-8	n-Butylbenzene	10 Y
120-82-1	1,2,4-Trichlorobenzene	45 U
91-20-3	Naphthalene	45 U
87-61-6	1,2,3-Trichlorobenzene	45 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.8%
d8-Toluene	97.9%
Bromofluorobenzene	96.9%
d4-1,2-Dichlorobenzene	97.7%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S4

Lab Sample ID: Q046B

LIMS ID: 96-14767

Matrix: Soil

Data Release Authorized: *SLB*

Reported: 09/12/96

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Sampled:

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.97 g dry Wt

Date Analyzed: 09/10/96

Percent Moisture: 21.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.5 U
74-83-9	Bromomethane	2.5 U
75-01-4	Vinyl Chloride	2.5 U
75-00-3	Chloroethane	2.5 U
75-09-2	Methylene Chloride	3.1 B
67-64-1	Acetone	46 B
75-15-0	Carbon Disulfide	1.9
75-35-4	1,1-Dichloroethene	1.3 U
75-34-3	1,1-Dichloroethane	1.3 U
156-60-5	trans-1,2-Dichloroethene	1.3 U
156-59-2	cis-1,2-Dichloroethene	1.3 U
67-66-3	Chloroform	1.3 U
107-06-2	1,2-Dichloroethane	1.3 U
78-93-3	2-Butanone	6.3 U
71-55-6	1,1,1-Trichloroethane	1.3 U
56-23-5	Carbon Tetrachloride	1.3 U
108-05-4	Vinyl Acetate	6.3 U
75-27-4	Bromodichloromethane	1.3 U
78-87-5	1,2-Dichloropropane	1.3 U
10061-01-5	cis-1,3-Dichloropropene	1.3 U
79-01-6	Trichloroethene	1.3 U
124-48-1	Dibromochloromethane	1.3 U
79-00-5	1,1,2-Trichloroethane	1.3 U
71-43-2	Benzene	1.3 U
10061-02-6	trans-1,3-Dichloropropene	1.3 U
110-75-8	2-Chloroethylvinylether	6.3 U
75-25-2	Bromoform	1.3 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.3 U
591-78-6	2-Hexanone	6.3 U
127-18-4	Tetrachloroethene	1.3 U
79-34-5	1,1,2,2-Tetrachloroethane	1.6 Y
108-88-3	Toluene	1.3 U
108-90-7	Chlorobenzene	1.3 U
100-41-4	Ethylbenzene	1.3 U
100-42-5	Styrene	1.3 U
75-69-4	Trichlorofluoromethane	2.5 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.5 U
	m,p-Xylene	1.3 U

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Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S4

Lab Sample ID: Q046B

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14767

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *[Signature]*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.97 g dry Wt

Date Analyzed: 09/10/96

Percent Moisture: 21.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.3 U
95-50-1	1,2-Dichlorobenzene	1.3 U
541-73-1	1,3-Dichlorobenzene	1.3 U
106-46-7	1,4-Dichlorobenzene	1.3 U
107-02-8	Acrolein	63 U
74-88-4	Methyl Iodide	1.3 U
74-96-4	Bromoethane	2.5 U
107-13-1	Acrylonitrile	6.3 U
563-58-6	1,1-Dichloropropene	1.3 U
74-95-3	Dibromomethane	1.3 U
630-20-6	1,1,1,2-Tetrachloroethane	1.3 U
96-12-8	1,2-Dibromo-3-chloropropane	6.3 U
96-18-4	1,2,3-Trichloropropane	1.3 U
110-57-6	trans-1,4-Dichloro-2-butene	13 Y
108-67-8	1,3,5-Trimethylbenzene	1.3 U
95-63-6	1,2,4-Trimethylbenzene	1.3 U
87-68-3	Hexachlorobutadiene	6.3 U
106-93-4	Ethylene Dibromide	1.3 U
74-97-5	Bromochloromethane	1.3 U
590-20-7	2,2-Dichloropropane	1.3 U
142-28-9	1,3-Dichloropropane	1.3 U
98-82-8	Isopropylbenzene	1.3 U
103-65-1	n-Propylbenzene	1.3 U
108-86-1	Bromobenzene	1.3 U
95-49-8	2-Chlorotoluene	1.3 U
106-43-4	4-Chlorotoluene	1.3 U
98-06-6	tert-Butylbenzene	1.3 U
135-98-8	sec-Butylbenzene	1.3 U
99-87-6	4-Isopropyltoluene	1.3 U
104-51-8	n-Butylbenzene	1.3 U
120-82-1	1,2,4-Trichlorobenzene	6.3 U
91-20-3	Naphthalene	6.3 U
87-61-6	1,2,3-Trichlorobenzene	6.3 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.4%
d8-Toluene	94.7%
Bromofluorobenzene	90.1%
d4-1,2-Dichlorobenzene	96.8%



Sample No: Method Blank

Lab Sample ID: 090996MB

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *JF*

Date Sampled: NA

Reported: 09/12/96

Date Received: NA

Instrument: FINN1

Sample Amount: 5.00 g dry Wt Equiv

Date Analyzed: 09/09/96

Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 U
75-09-2	Methylene Chloride	2.5
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
Page 2 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: Method Blank

Lab Sample ID: 090996MB QC Report No: Q046-Hart Crowser
LIMS ID: 96-14766 Project: Fox Ave Property
Matrix: Soil J-4618
Data Release Authorized: *etp* Date Sampled: NA
Reported: 09/12/96 Date Received: NA

Instrument: FINN1 Sample Amount: 5.00 g dry Wt Equiv
Date Analyzed: 09/09/96 Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-83-9	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	1.0 U
110-57-6	trans-1,4-Dichloro-2-butene	10 Y
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
590-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	96.1%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	98.0%



Sample No: Method Blank

Lab Sample ID: 091096MB

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14767

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *[Signature]*

Date Sampled: NA

Reported: 09/12/96

Date Received: NA

Instrument: FINN1

Sample Amount: 5.00 g dry Wt Equiv

Date Analyzed: 09/10/96

Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 U
75-09-2	Methylene Chloride	2.2
67-64-1	Acetone	5.6
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
Page 2 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: Method Blank

Lab Sample ID: 091096MB

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14767

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *AB*

Date Sampled: NA

Reported: 09/12/96

Date Received: NA

Instrument: FINN1

Sample Amount: 5.00 g dry Wt Equiv

Date Analyzed: 09/10/96

Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-83-9	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	1.0 U
110-57-6	trans-1,4-Dichloro-2-butene	10 Y
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
590-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.3%
d8-Toluene	97.9%
Bromofluorobenzene	98.9%
d4-1,2-Dichlorobenzene	98.2%

ORGANICS ANALYSIS DATA SHEET
Volatiles by GC/MS
Page 1 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: Q046SB

LIMS ID: 96-14766

Matrix: Soil

Data Release Authorized: *ANP*

Reported: 09/12/96

Date Analyzed: 09/09/96

Instrument: FINNI

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	60.3	50.0	121%
Bromomethane	53.3	50.0	107%
Vinyl Chloride	62.5	50.0	125%
Chloroethane	56.5	50.0	113%
Methylene Chloride	50.4	50.0	101%
Acetone	261.	250	104%
Carbon Disulfide	72.6	50.0	145%
1,1-Dichloroethene	49.5	50.0	99.0%
1,1-Dichloroethane	50.4	50.0	101%
trans-1,2-Dichloroethene	49.4	50.0	98.8%
cis-1,2-Dichloroethene	49.6	50.0	99.2%
Chloroform	50.8	50.0	102%
1,2-Dichloroethane	50.0	50.0	100%
2-Butanone	259.	250	104%
1,1,1-Trichloroethane	51.3	50.0	103%
Carbon Tetrachloride	51.4	50.0	103%
Vinyl Acetate	26.0	50.0	52.0%
Bromodichloromethane	50.8	50.0	102%
1,2-Dichloropropane	50.4	50.0	101%
cis-1,3-Dichloropropene	50.4	50.0	101%
Trichloroethene	49.4	50.0	98.8%
Dibromochloromethane	50.6	50.0	101%
1,1,2-Trichloroethane	50.3	50.0	101%
Benzene	49.4	50.0	98.8%
trans-1,3-Dichloropropene	49.8	50.0	99.6%
2-Chloroethylvinylether	19.0	50.0	38.0%
Bromoform	51.6	50.0	103%
4-Methyl-2-Pentanone (MIBK)	257.	250	103%
2-Hexanone	262.	250	105%
Tetrachloroethene	49.8	50.0	99.6%
1,1,2,2-Tetrachloroethane	49.3	50.0	98.6%
Toluene	50.5	50.0	101%
Chlorobenzene	49.0	50.0	98.0%
Ethylbenzene	50.2	50.0	100%
Styrene	51.0	50.0	102%
Trichlorofluoromethane	50.6	50.0	101%
1,1,2-Trichlorotrifluoroethane	68.0	50.0	136%
m,p-Xylene	99.9	100	99.9%
O-Xylene	50.0	50.0	100%

Reported in ug/kg-dry-wt

FORM-III



Lab Sample ID: Q046SB

LIMS ID: 96-14766

Matrix: Soil

Data Release Authorized: *MP*

Reported: 09/12/96

Date Analyzed: 09/09/96

Instrument: FINN1

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Received: NA

LABORATORY CONTROL SAMPLE	SPIKE	SPIKE	%
CONSTITUENT	VALUE	AMT	RECOVERY
1,2-Dichlorobenzene	49.1	50.0	98.2%
1,3-Dichlorobenzene	49.3	50.0	98.6%
1,4-Dichlorobenzene	49.4	50.0	98.8%
Acrolein	535.	250	214%
Methyl Iodide	66.9	50.0	134%
Bromoethane	63.5	50.0	127%
Acrylonitrile	56.5	50.0	113%
1,1-Dichloropropene	52.4	50.0	105%
Dibromomethane	51.7	50.0	103%
1,1,1,2-Tetrachloroethane	49.6	50.0	99.2%
1,2-Dibromo-3-chloropropane	48.8	50.0	97.6%
1,2,3-Trichloropropane	49.6	50.0	99.2%
trans-1,4-Dichloro-2-butene	53.8	50.0	108%
1,3,5-Trimethylbenzene	49.6	50.0	99.2%
1,2,4-Trimethylbenzene	49.9	50.0	99.8%
Hexachlorobutadiene	45.5	50.0	91.0%
Ethylene Dibromide	48.7	50.0	97.4%
Bromochloromethane	50.8	50.0	102%
2,2-Dichloropropane	51.8	50.0	104%
1,3-Dichloropropane	49.2	50.0	98.4%
Isopropylbenzene	55.4	50.0	111%
n-Propylbenzene	49.0	50.0	98.0%
Bromobenzene	50.8	50.0	102%
2-Chlorotoluene	50.2	50.0	100%
4-Chlorotoluene	48.2	50.0	96.4%
tert-Butylbenzene	48.0	50.0	96.0%
sec-Butylbenzene	48.8	50.0	97.6%
4-Isopropyltoluene	51.0	50.0	102%
n-Butylbenzene	48.9	50.0	97.8%
1,2,4-Trichlorobenzene	47.9	50.0	95.8%
Naphthalene	49.2	50.0	98.4%
1,2,3-Trichlorobenzene	47.1	50.0	94.2%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	99.7%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	102%

Reported in ug/kg-dry-wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by GC/MS
Page 1 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: Q046SB

LIMS ID: 96-14767

Matrix: Soil

Data Release Authorized: *CHP*

Reported: 09/12/96

Date Analyzed: 09/10/96

Instrument: FINN1

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Received: NA

LABORATORY CONTROL SAMPLE	SPIKE	SPIKE	%
CONSTITUENT	VALUE	AMT	RECOVERY
Chloromethane	75.6	50.0	151%
Bromomethane	57.3	50.0	115%
Vinyl Chloride	62.0	50.0	124%
Chloroethane	54.9	50.0	110%
Methylene Chloride	49.4	50.0	98.8%
Acetone	266.	250	106%
Carbon Disulfide	48.3	50.0	96.6%
1,1-Dichloroethene	49.0	50.0	98.0%
1,1-Dichloroethane	50.0	50.0	100%
trans-1,2-Dichloroethene	49.0	50.0	98.0%
cis-1,2-Dichloroethene	49.8	50.0	99.6%
Chloroform	49.3	50.0	98.6%
1,2-Dichloroethane	47.8	50.0	95.6%
2-Butanone	246.	250	98.4%
1,1,1-Trichloroethane	50.2	50.0	100%
Carbon Tetrachloride	49.0	50.0	98.0%
Vinyl Acetate	26.1	50.0	52.2%
Bromodichloromethane	49.1	50.0	98.2%
1,2-Dichloropropane	50.3	50.0	101%
cis-1,3-Dichloropropene	48.5	50.0	97.0%
Trichloroethene	47.9	50.0	95.8%
Dibromochloromethane	49.3	50.0	98.6%
1,1,2-Trichloroethane	48.1	50.0	96.2%
Benzene	49.4	50.0	98.8%
trans-1,3-Dichloropropene	47.4	50.0	94.8%
2-Chloroethylvinylether	14.3	50.0	28.6%
Bromoform	48.9	50.0	97.8%
4-Methyl-2-Pentanone (MIBK)	243.	250	97.2%
2-Hexanone	248.	250	99.2%
Tetrachloroethene	48.0	50.0	96.0%
1,1,2,2-Tetrachloroethane	47.2	50.0	94.4%
Toluene	49.1	50.0	98.2%
Chlorobenzene	48.3	50.0	96.6%
Ethylbenzene	49.2	50.0	98.4%
Styrene	48.9	50.0	97.8%
Trichlorofluoromethane	48.3	50.0	96.6%
1,1,2-Trichlorotrifluoroethane	51.2	50.0	102%
m,p-Xylene	96.7	100	96.7%
O-Xylene	48.4	50.0	96.8%

Reported in ug/kg-dry-Wt

FORM-III



Lab Sample ID: Q046SB QC Report No: Q046-Hart Crowser
LIMS ID: 96-14767 Project: Fox Ave Property
Matrix: Soil J-4618
Data Release Authorized: *WJF* Date Received: NA
Reported: 09/12/96
Date Analyzed: 09/10/96
Instrument: FINN1

LABORATORY CONTROL SAMPLE	SPIKE	SPIKE	%
CONSTITUENT	VALUE	AMT	RECOVERY
1,2-Dichlorobenzene	47.8	50.0	95.6%
1,3-Dichlorobenzene	47.6	50.0	95.2%
1,4-Dichlorobenzene	48.8	50.0	97.6%
Acrolein	506.	250	202%
Methyl Iodide	48.6	50.0	97.2%
Bromoethane	49.7	50.0	99.4%
Acrylonitrile	50.9	50.0	102%
1,1-Dichloropropene	50.4	50.0	101%
Dibromomethane	49.5	50.0	99.0%
1,1,1,2-Tetrachloroethane	47.8	50.0	95.6%
1,2-Dibromo-3-chloropropane	46.8	50.0	93.6%
1,2,3-Trichloropropane	46.1	50.0	92.2%
trans-1,4-Dichloro-2-butene	48.8	50.0	97.6%
1,3,5-Trimethylbenzene	48.0	50.0	96.0%
1,2,4-Trimethylbenzene	48.2	50.0	96.4%
Hexachlorobutadiene	44.5	50.0	89.0%
Ethylene Dibromide	46.8	50.0	93.6%
Bromochloromethane	49.5	50.0	99.0%
2,2-Dichloropropane	49.9	50.0	99.8%
1,3-Dichloropropane	48.0	50.0	96.0%
Isopropylbenzene	53.6	50.0	107%
n-Propylbenzene	47.7	50.0	95.4%
Bromobenzene	49.2	50.0	98.4%
2-Chlorotoluene	45.3	50.0	90.6%
4-Chlorotoluene	51.9	50.0	104%
tert-Butylbenzene	43.5	50.0	87.0%
sec-Butylbenzene	47.0	50.0	94.0%
4-Isopropyltoluene	49.0	50.0	98.0%
n-Butylbenzene	47.3	50.0	94.6%
1,2,4-Trichlorobenzene	47.3	50.0	94.6%
Naphthalene	47.9	50.0	95.8%
1,2,3-Trichlorobenzene	47.0	50.0	94.0%

<u>Spike Blank Surrogate Recovery</u>	
d4-1,2-Dichloroethane	102%
d8-Toluene	99.1%
Bromofluorobenzene	99.6%
d4-1,2-Dichlorobenzene	99.5%

Reported in ug/kg-dry-Wt



ORGANICS ANALYSIS DATA SHEET

Volatiles by GC/MS

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Lab Sample ID: Q046A

LIMS ID: 96-14766

Matrix: Soil

Sample No: HC4-S3

QC Report No: Q046-Hart Crowser

Project: Fox Ave Property

J-4618

Date Received: 09/06/96

Data Release Authorized: *[Signature]*

Reported: 09/12/96

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Date Analyzed: 09/09/96

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE					
Chloromethane	< 2.8	96.8	68.3	142%	
Bromomethane	< 2.8	58.6	68.3	85.8%	
Vinyl Chloride	< 2.8	75.6	68.3	111%	
Chloroethane	< 2.8	66.7	68.3	97.6%	
Methylene Chloride	3.8	57.1	68.3	78.0%	
Acetone	37.5	342	342	89.2%	
Carbon Disulfide	2.9	73.8	68.3	104%	
1,1-Dichloroethene	< 1.4	53.4	68.3	78.2%	
1,1-Dichloroethane	< 1.4	57.6	68.3	84.3%	
trans-1,2-Dichloroethene	3.4	52.5	68.3	71.8%	
cis-1,2-Dichloroethene	80.4	191	68.3	162%	
Chloroform	< 1.4	51.8	68.3	75.8%	
1,2-Dichloroethane	< 1.4	48.6	68.3	71.2%	
2-Butanone	< 6.9	303	342	88.7%	
1,1,1-Trichloroethane	< 1.4	54.6	68.3	79.9%	
Carbon Tetrachloride	< 1.4	50.9	68.3	74.5%	
Vinyl Acetate	< 6.9	0.00	68.3	0.0%	
Bromodichloromethane	< 1.4	44.6	68.3	65.3%	
1,2-Dichloropropane	< 1.4	49.9	68.3	73.1%	
cis-1,3-Dichloropropene	< 1.4	38.4	68.3	56.2%	
Trichloroethene	68.0	149	68.3	119%	
Dibromochloromethane	< 1.4	38.9	68.3	56.9%	
1,1,2-Trichloroethane	< 1.4	40.6	68.3	59.4%	
Benzene	< 1.4	50.4	68.3	73.8%	
trans-1,3-Dichloropropene	< 1.4	31.2	68.3	45.7%	
2-Chloroethylvinylether	< 6.9	12.5	68.3	18.3%	
Bromoform	< 1.4	32.9	68.3	48.2%	
4-Methyl-2-Pentanone (MIBK)	< 6.9	291	342	85.2%	
2-Hexanone	< 6.9	308	342	90.2%	
Tetrachloroethene	357.	434	68.3	113%	
1,1,2,2-Tetrachloroethane	< 1.4	52.6	68.3	77.0%	
Toluene	< 1.4	44.1	68.3	64.6%	
Chlorobenzene	< 1.4	37.9	68.3	55.5%	
Ethylbenzene	< 1.4	44.8	68.3	65.6%	
Styrene	< 1.4	33.6	68.3	49.2%	
Trichlorofluoromethane	< 2.8	56.2	68.3	82.3%	

Reported in ug/kg-dry-wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by GC/MS
Page 2 of 4



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: Q046A
LIMS ID: 96-14766
Matrix: Soil

Sample No: HC4-S3
QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Date Received: 09/06/96

Data Release Authorized: *DA*
Reported: 09/12/96

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Date Analyzed: 09/09/96

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE					
1,1,2-Trichlorotrifluoroethane	< 2.8	64.2	68.3	94.0%	
m,p-Xylene	< 1.4	87.7	137	64.2%	
O-Xylene	1.6	41.1	68.3	57.8%	
1,2-Dichlorobenzene	< 1.4	30.4	68.3	44.5%	
1,3-Dichlorobenzene	< 1.4	31.5	68.3	46.1%	
1,4-Dichlorobenzene	< 1.4	30.5	68.3	44.7%	
Acrolein	< 69.1	358	342	105%	
Methyl Iodide	< 1.4	57.3	68.3	83.9%	
Bromoethane	< 2.8	70.6	68.3	103%	
Acrylonitrile	< 6.9	58.0	68.3	84.9%	
1,1-Dichloropropene	< 1.4	49.0	68.3	71.7%	
Dibromomethane	< 1.4	42.9	68.3	62.8%	
1,1,1,2-Tetrachloroethane	< 1.4	42.5	68.3	62.2%	
1,2-Dibromo-3-chloropropane	< 6.9	29.8	68.3	43.6%	
1,2,3-Trichloropropane	< 1.4	46.4	68.3	67.9%	
trans-1,4-Dichloro-2-butene	< 13.8	13.7	68.3	20.1%	
1,3,5-Trimethylbenzene	16.5	65.3	68.3	71.4%	
1,2,4-Trimethylbenzene	34.7	88.6	68.3	78.9%	
Hexachlorobutadiene	< 6.9	21.6	68.3	31.6%	
Ethylene Dibromide	< 1.4	33.3	68.3	48.8%	
Bromochloromethane	< 1.4	50.9	68.3	74.5%	
2,2-Dichloropropane	< 1.4	54.3	68.3	79.5%	
1,3-Dichloropropane	< 1.4	44.4	68.3	65.0%	
Isopropylbenzene	1.4	56.9	68.3	81.2%	
n-Propylbenzene	< 1.4	46.2	68.3	67.6%	
Bromobenzene	< 1.4	60.3	68.3	88.3%	
2-Chlorotoluene	< 1.4	46.3	68.3	67.8%	
4-Chlorotoluene	< 1.4	33.5	68.3	49.0%	
tert-Butylbenzene	< 1.4	44.2	68.3	64.7%	
sec-Butylbenzene	5.0	48.2	68.3	63.2%	
4-Isopropyltoluene	6.2	46.6	68.3	59.2%	
n-Butylbenzene	2.8	45.1	68.3	62.0%	
1,2,4-Trichlorobenzene	< 6.9	18.8	68.3	27.5%	
Naphthalene	8.9	38.3	68.3	43.0%	
1,2,3-Trichlorobenzene	< 6.9	16.4	68.3	24.0%	

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET

Volatiles by GC/MS

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ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: Q046A

Sample No: HC4-S3
QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Date Received: 09/06/96

Data Release Authorized: *DPJ*

Reported: 09/12/96

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Date Analyzed: 09/09/96

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
Chloromethane	< 2.8	99.5	67.2	148%	4.3%
Bromomethane	< 2.8	66.3	67.2	98.7%	14%
Vinyl Chloride	< 2.8	74.4	67.2	111%	0.3%
Chloroethane	< 2.8	68.7	67.2	102%	4.4%
Methylene Chloride	3.8	61.5	67.2	85.8%	9.6%
Acetone	37.5	355	336	94.5%	5.8%
Carbon Disulfide	2.9	59.9	67.2	84.8%	20%
1,1-Dichloroethene	< 1.4	54.2	67.2	80.6%	3.1%
1,1-Dichloroethane	< 1.4	60.0	67.2	89.3%	5.7%
trans-1,2-Dichloroethene	3.4	52.7	67.2	73.3%	2.0%
cis-1,2-Dichloroethene	80.4	139	67.2	87.2%	60%
Chloroform	< 1.4	55.4	67.2	82.4%	8.3%
1,2-Dichloroethane	< 1.4	55.6	67.2	82.7%	15%
2-Butanone	< 6.9	333	336	99.1%	11%
1,1,1-Trichloroethane	< 1.4	52.7	67.2	78.4%	1.9%
Carbon Tetrachloride	< 1.4	49.0	67.2	72.9%	2.2%
Vinyl Acetate	< 6.9	0.00	67.2	0.0%	NA
Bromodichloromethane	< 1.4	49.8	67.2	74.1%	13%
1,2-Dichloropropane	< 1.4	53.5	67.2	79.6%	8.6%
cis-1,3-Dichloropropene	< 1.4	44.4	67.2	66.1%	16%
Trichloroethene	68.0	108	67.2	59.5%	66%
Dibromochloromethane	< 1.4	44.2	67.2	65.8%	14%
1,1,2-Trichloroethane	< 1.4	47.9	67.2	71.3%	18%
Benzene	< 1.4	52.2	67.2	77.7%	5.2%
trans-1,3-Dichloropropene	< 1.4	37.5	67.2	55.8%	20%
2-Chloroethylvinylether	< 6.9	14.4	67.2	21.4%	16%
Bromoform	< 1.4	41.1	67.2	61.2%	24%
4-Methyl-2-Pentanone (MIBK)	< 6.9	320	336	95.2%	11%
2-Hexanone	< 6.9	301	336	89.6%	0.6%
Tetrachloroethene	357.	301	67.2	NR	NA
1,1,2,2-Tetrachloroethane	< 1.4	49.6	67.2	73.8%	4.3%
Toluene	< 1.4	44.8	67.2	66.7%	3.3%
Chlorobenzene	< 1.4	37.3	67.2	55.5%	0.0%
Ethylbenzene	< 1.4	41.5	67.2	61.8%	5.9%
Styrene	< 1.4	33.6	67.2	50.0%	1.6%
Trichlorofluoromethane	< 2.8	52.6	67.2	78.3%	5.0%

Reported in ug/kg-dry-Wt

FORM-III



Lab Sample ID: Q046A
LIMS ID: 96-14766
Matrix: Soil
Sample No: HC4-S3
QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618
Date Received: 09/06/96
Data Release Authorized: *AWP*
Reported: 09/12/96

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 09/09/96

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
1,1,2-Trichlorotrifluoroethane<	2.8	55.0	67.2	81.8%	14%
m,p-Xylene	< 1.4	79.7	134	59.3%	7.9%
O-Xylene	1.6	39.2	67.2	56.0%	3.2%
1,2-Dichlorobenzene	< 1.4	29.1	67.2	43.3%	2.7%
1,3-Dichlorobenzene	< 1.4	28.8	67.2	42.9%	7.2%
1,4-Dichlorobenzene	< 1.4	28.5	67.2	42.4%	5.2%
Acrolein	< 69.1	406	336	121%	14%
Methyl Iodide	< 1.4	63.3	67.2	94.2%	12%
Bromoethane	< 2.8	73.9	67.2	110%	6.2%
Acrylonitrile	< 6.9	69.4	67.2	103%	19%
1,1-Dichloropropene	< 1.4	47.7	67.2	71.0%	1.0%
Dibromomethane	< 1.4	52.5	67.2	78.1%	22%
1,1,1,2-Tetrachloroethane	< 1.4	44.3	67.2	65.9%	5.7%
1,2-Dibromo-3-chloropropane	< 6.9	35.4	67.2	52.7%	19%
1,2,3-Trichloropropane	< 1.4	52.2	67.2	77.7%	13%
trans-1,4-Dichloro-2-butene	< 13.8	41.5	67.2	61.8%	100%
1,3,5-Trimethylbenzene	16.5	48.5	67.2	47.6%	40%
1,2,4-Trimethylbenzene	34.7	59.3	67.2	36.6%	73%
Hexachlorobutadiene	< 6.9	19.5	67.2	29.0%	8.7%
Ethylene Dibromide	< 1.4	42.7	67.2	63.5%	26%
Bromochloromethane	< 1.4	58.2	67.2	86.6%	15%
2,2-Dichloropropane	< 1.4	54.5	67.2	81.1%	2.0%
1,3-Dichloropropane	< 1.4	50.0	67.2	74.4%	13%
Isopropylbenzene	1.4	48.1	67.2	69.5%	16%
n-Propylbenzene	< 1.4	39.3	67.2	58.5%	14%
Bromobenzene	< 1.4	41.1	67.2	61.2%	36%
2-Chlorotoluene	< 1.4	36.6	67.2	54.5%	22%
4-Chlorotoluene	< 1.4	34.4	67.2	51.2%	4.3%
tert-Butylbenzene	< 1.4	37.4	67.2	55.7%	15%
sec-Butylbenzene	5.0	38.0	67.2	49.1%	25%
4-Isopropyltoluene	6.2	37.9	67.2	47.2%	22%
n-Butylbenzene	2.8	34.5	67.2	47.2%	27%
1,2,4-Trichlorobenzene	< 6.9	18.2	67.2	27.1%	1.5%
Naphthalene	8.9	31.3	67.2	33.3%	25%
1,2,3-Trichlorobenzene	< 6.9	18.0	67.2	26.8%	11%

Reported in ug/kg-dry-wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3

MATRIX SPIKE

Lab Sample ID: Q046A-MS

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *JB*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.66 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
	m,p-Xylene	---

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3

MATRIX SPIKE

Lab Sample ID: Q046A-MS

QC Report No: Q046-Hart Crowser

LIMS ID: 96-14766

Project: Fox Ave Property

Matrix: Soil

J-4618

Data Release Authorized: *[Signature]*

Date Sampled:

Reported: 09/12/96

Date Received: 09/06/96

Instrument: FINN1

Sample Amount: 3.66 g dry Wt

Date Analyzed: 09/09/96

Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
590-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	96.3%
Bromofluorobenzene	92.6%
d4-1,2-Dichlorobenzene	95.6%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
Page 1 of 2



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3
SPIKE DUPLICATE

Lab Sample ID: Q046A-MSD
LIMS ID: 96-14766
Matrix: Soil
Data Release Authorized: *AMS*
Reported: 09/12/96

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618
Date Sampled:
Date Received: 09/06/96

Instrument: FINN1
Date Analyzed: 09/10/96
Sample Amount: 3.72 g dry Wt
Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
	m,p-Xylene	---

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS
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ANALYTICAL
RESOURCES
INCORPORATED

Sample No: HC4-S3
SPIKE DUPLICATE

Lab Sample ID: Q046A-MSD
LIMS ID: 96-14766
Matrix: Soil

QC Report No: Q046-Hart Crowser
Project: Fox Ave Property
J-4618

Data Release Authorized: *[Signature]*
Reported: 09/12/96

Date Sampled:
Date Received: 09/06/96

Instrument: FINN1
Date Analyzed: 09/10/96

Sample Amount: 3.72 g dry Wt
Percent Moisture: 27.5%

CAS Number	Analyte	ug/kg
95-47-6	O-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
590-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	98.3%
Bromofluorobenzene	97.6%
d4-1,2-Dichlorobenzene	98.0%